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THE FATE OF INTRAGLUTEAL INJECTIONS *

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DETROIT

Much has been written on the technic of intramuscular injection, but little work has been done in man, on its local dispersion. It was felt that such a study might offer some explanation for local reactions. It was also hoped that it might establish some rational foundation for the dispersion of intramuscular injections.

The technic of injection used for this study is that outlined in detail by Stokes.[1] This consists essentially of securing complete relaxation in the patient by having him lie on his abdomen on a narrow table with arms hanging over the sides of the table and "toed in" to relax the gluteus maximus muscle. The buttock is divided into four equal quadrants, and the injection is given near the angle of the upper outer quadrant. The left hand is used to pull down on the skin and superficial fascia before the needle is inserted. This acts as a valve and prevents leakage along the puncture wound when the skin is released and the needle withdrawn. Careful aspiration of the dry needle is cautioned. I have never felt qualified to subscribe to an epifascial deposition of such injections. Wechselmann,[2] Wolbarst [3] and Stokes,[1] in their writings, failed to make clear the meaning of the term "epifascial" and the localization of such injections. In a true sense, "epifascial" would mean depositing the injected material on the superficial fascia of the gluteus maximus and not intramuscularly. This would seem to be a difficult feat to perform, with a large element of hit and miss, in the hurried execution of a simplified technic. From the results of this study, however, I feel that any injection within the body of the gluteus maximus muscle follows the course of one of the numerous fascial septums into which this muscle is divided, and is therefore fascial as well as intramuscular.

Syphilologists have all had the suspicion that the injected fluid does not remain at the site of injection. Pain may be complained of

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* Read before the Section on Dermatology and Syphilology of the Seventy-Ninth Annual Session of the American Medical Association, June 14, 1928.

1. Stokes, J. H.: M. J. & Rec. **99**:730 (April 30) 1921; Modern Clinical Syphilology, Philadelphia, W. B. Saunders Company, 1926, pp. 226-235.

2. Wechselmann, W.: München med. Wchnschr. **60**:1309, 1913. Wechselmann and Eicke: München med. Wchnschr. **61**:535, 1914.

3. Wolbarst, A. L.: M. J. & Rec. **89**:999 (June 3) 1916.

in areas quite distant to that used for injection, as muscular soreness or sciatic-like pain extending along the course of this nerve to the knee or even to the heel. It was suggested to me by my former chief, Dr. J. H. Stokes, that valuable information could probably be gleaned by injecting moribund patients and dissecting out the course of such injections in a postmortem examination. Such opportunities were difficult to secure. Instead, colored solutions and suspensions were injected into cadavers. Owing to the lack of mobility and to rigidity of the tissues, either in the fixed cadaver of the anatomic laboratory or of the autopsy room, it was soon felt that such conditions were not strictly applicable to life. It was also found that colored solutions and suspensions were difficult to follow in any detail as to their ramifications in the tissue. Certain anatomic features of this region were brought out, however, which are worthy of review in relation to later observations.

ANATOMY

The skin of the buttock is thick and coarse and only slightly movable on the underlying parts. The blood supply is not as free as in other parts of the body surface. The superficial fascia which it covers is loosely attached and contains a large amount of fat. It is due to the fat contained in this superficial fascia rather than to the muscular development, that the buttock is round and prominent; this is especially true in women. The thickness of the superficial fascia may vary from one-fourth inch (6.35 mm.) to several inches in obese persons, and the depth determines the length of needle necessary for intramuscular injection.

The cutaneous nerves of the buttock do not play an important part in intragluteal injections, except when subcutaneous nodules are formed, either from superficial injection, leakage along the needle track, or rupture of the thin layer of fascia over the gluteus maximus muscle. Since these nerves lie immediately over the gluteal fascia it is also probable that they are involved in the inflammatory reaction of irritating injections, when these injections are made superficially into the gluteus maximus. The location of the main nerve trunks are shown in figure 1.

The deep fascia of the buttock is an important structure in relation to injections into this area. It is continuous with the deep fascia of the thigh, and near the coccyx with the anal fascia, and is attached above to the crest of the ileum and behind to the sacrum, coccyx and great sacrosciatic ligament. It is much thicker in front where it crosses the gluteus medius muscle than behind where it covers the gluteus maximus; in the latter situation it is comparatively thin and transparent. It is this fact that probably accounts for the ready leakage of superficial injections along the track of the needle into the fatty subcutaneous tissue. At the anterior border of the gluteus maximus the deep fascia

divides into two layers; the superficial layer covering the upper surface and the deep layer its under surface, thus encasing the muscle in the split fascia.

The superficial layer of the gluteal fascia in passing over the gluteus maximus sends septums into the muscle to encase bundles of fibers. It is on account of these septums that the muscle is so hard to clean

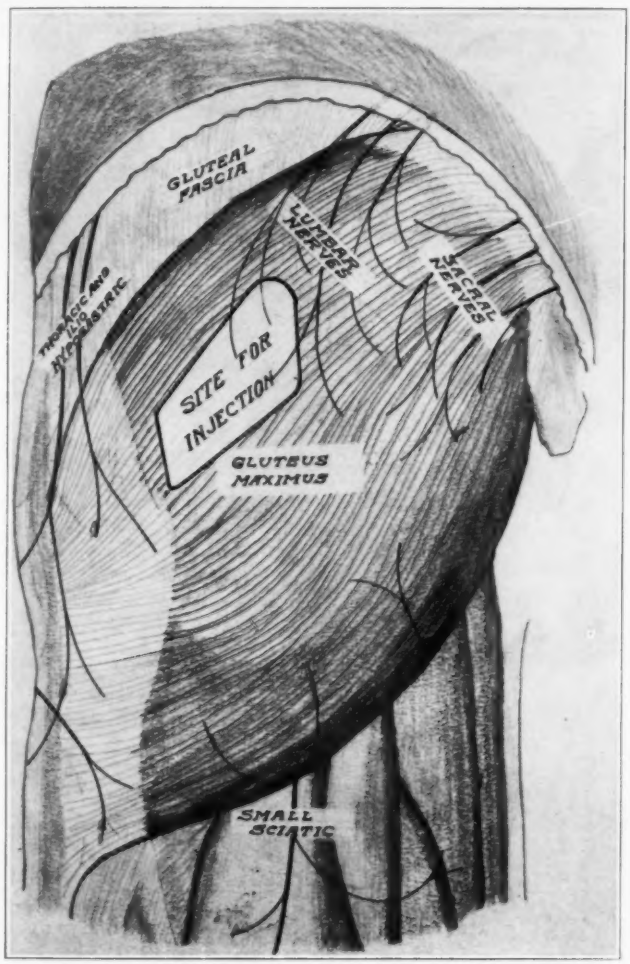

Fig. 1.—Cutaneous nerves and gluteus maximus on the left buttock.

and presents such a coarse appearance. It is the division of this muscle into these coarse bundles of fibers, which are encased in fascia and running in the general direction of origin and insertion of the muscle, that determines the course and spread of injections into its substance. The fact that it is invested so completely by fascia confines such materials strictly to the muscle and makes it the site of election for such injections.

The gluteus maximus is a powerful muscle which arises from an extensive origin on the upper inner quadrant of the buttock, and proceeds obliquely downward and forward toward the proximal portion of the femur. The general relations of the origin and insertion of the muscle are shown in figure 1. An injection placed too high in the upper outer quadrant will miss this muscle or strike only its edge and be deposited on the thick gluteal fascia or enter the gluteus medius muscle. The gluteus maximus is thick in its central portion and varied

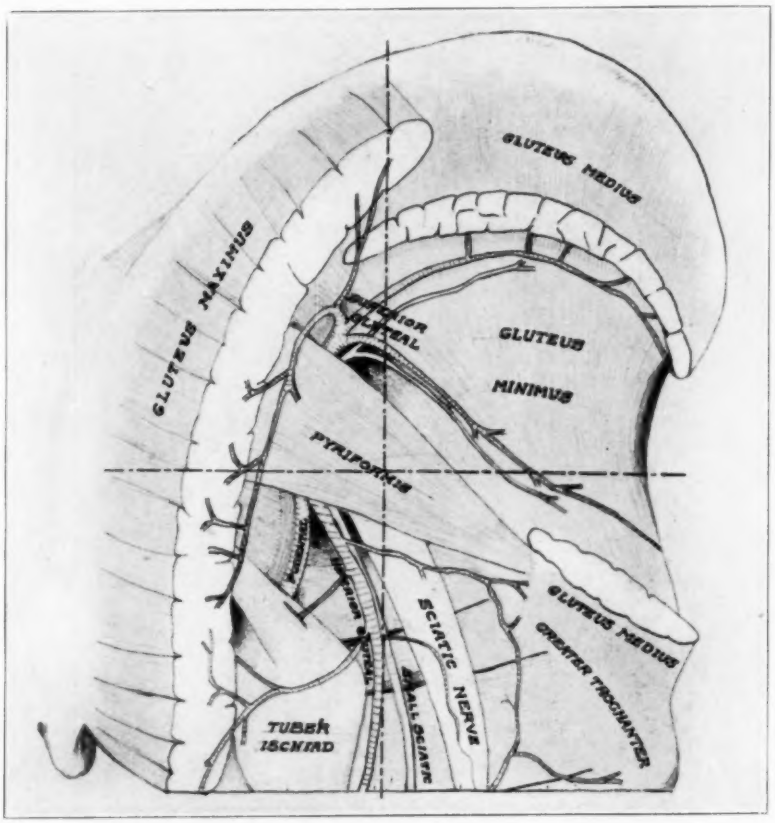

Fig. 2.—Right gluteal region, showing the gluteus maximus and medius resected.

from ¾ to 1¾ inches (19.05 mm. to 4.46 cm.) in a number of measurements taken in the anatomic laboratory. For the average person an injection from 1 to 1½ inches (2.54 to 3.81 cm.) in depth will remain within the substance of this muscle.

When the gluteus maximus muscle is reflected, its blood supply is revealed. The upper portion near the ileum is supplied by the superficial division of the superior gluteal artery and vein and is too high

to be a common danger in intragluteal injection (fig. 2). Branches of the inferior gluteal vessels and nerves are found entering the muscle in the lower portion near the tuberosity of the ischium. These vessels send branches along the underside of the muscle that can readily be seen through the fascia. The veins are voluminous (venae comites). (They were about the size of a slate pencil in the specimen dissected.) Such a branch crosses near the point of election for injection and accounts for the ever present danger of oil embolism.

Four groups of structures lie under cover of the gluteus maximus, namely, bursae, muscles, vessels and nerves. The bursae play little part in this study. The space between the fascia of the opposing muscles is slight except about the sciatic nerve where a fairly thick fibrous sheath richly interspersed with fat acts as a protection for this nerve. Injections so placed as to fall within this space tend to seek a lower level and thus invade the region of this nerve. Injections made deeply into the lower inner angle of the upper outer quadrant of the buttock, particularily if the needle is slanted downward and inward, may be deposited into the substance of this nerve and thus cause severe sciatic neuritis (figs. 2, 3 and 4). That this is an anatomic fact was proved in the dissecting room on repeated trials. As stated, the great sciatic nerve is so protected by a dense fatty sheath that there is probably little irritation unless injections are made directly into its substance. The small sciatic nerve, however, that overlies the great sciatic nerve in this area, is not so protected and has a thin sheath. It is felt that it is irritation of this nerve that causes the rather frequent cases of neuralgic-like pain which extends down the back of the leg. Such reasoning is strengthened by the sensory rather than the motor character of the involvement. Any injection placed within the space between the fascia of the gluteus maximus and medius, influenced by gravity, muscular action and the funnel-shaped character of the space, would tend to flow toward this nerve. Similarly, any leakage into the space from deep injections into the gluteus medius would tend to seek the same point. Care should therefore be exercised to avoid injections into this space and particularly to avoid deep injections over the great sciatic nerve (fig. 4).

The vessels in this area are the superior and inferior gluteal arteries and veins, accompanied closely by nerves of the same name. Their location is not emphasized, since they seemingly do not play any great part in this study.

The inferior gluteal nerve supplies the gluteus maximus. Its branches evidently play an important part in the pain from local reactions in this muscle. This nerve springs from the sacral plexus and enters the gluteal region through the lower part of the great sciatic foramen. It breaks up into numerous twigs which enter the deep surface of the gluteus maximus. Injections into this muscle, on or

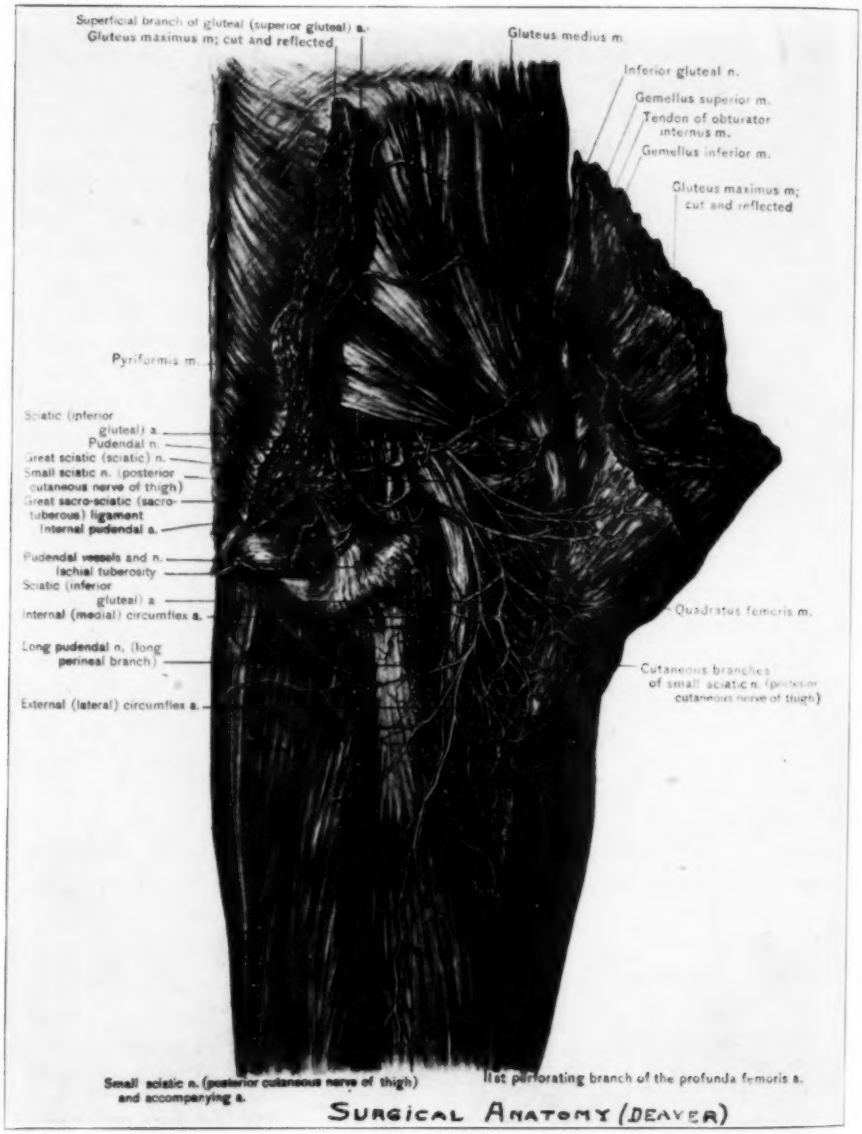
Superficial branch of gluteal (superior gluteal) a.
Gluteus maximus m; cut and reflected
Gluteus medius m.
Inferior gluteal n.
Gemellus superior m.
Tendon of obturator internus m.
Gemellus inferior m.
Gluteus maximus m; cut and reflected
Pyriformis m.
Sciatic (inferior gluteal) a.
Pudendal n.
Great sciatic (sciatic) n.
Small sciatic n. (posterior cutaneous nerve of thigh)
Great sacro-sciatic (sacro-tuberous) ligament
Internal pudendal a.
Pudendal vessels and n.
Ischial tuberosity
Sciatic (inferior gluteal) a.
Internal (medial) circumflex a.
Long pudendal n. (long perineal branch)
External (lateral) circumflex a.
Quadratus femoris m.
Cutaneous branches of small sciatic n. (posterior cutaneous nerve of thigh)
Small sciatic n. (posterior cutaneous nerve of thigh) and accompanying a.
1st perforating branch of the profunda femoris a.
SURGICAL ANATOMY (DEAVER)

Fig. 3.—Right gluteal region showing gluteus maximus resected (Deaver).

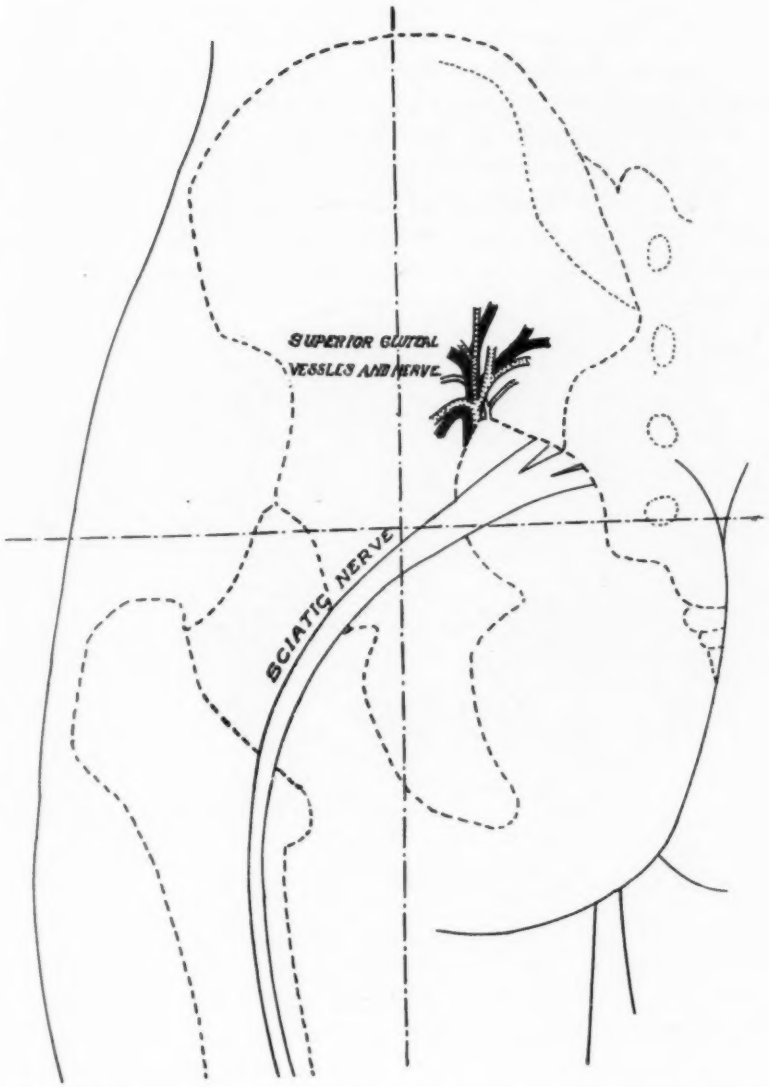

Fig. 4.—Left gluteal region showing relation of surface markings to bony structures and sciatic nerve.

near one of the larger of these branches, are largely hazardous. I have frequently noticed that an insertion of the needle otherwise properly placed but from which the patient complains of pain may be accompanied by much local soreness on injection. I feel that it is better to make another puncture when this occurs.

The gluteus medius and minimus are the other muscles that may figure in intragluteal injections of the upper outer quadrant. They are different in character from the gluteus maximus. They are large thick muscles near their origin, but are not divided into fasciculi by fascia to the extent of the gluteus maximus, and present smooth dense muscular tissue. In the cross-section shown in figure 5, one gains a

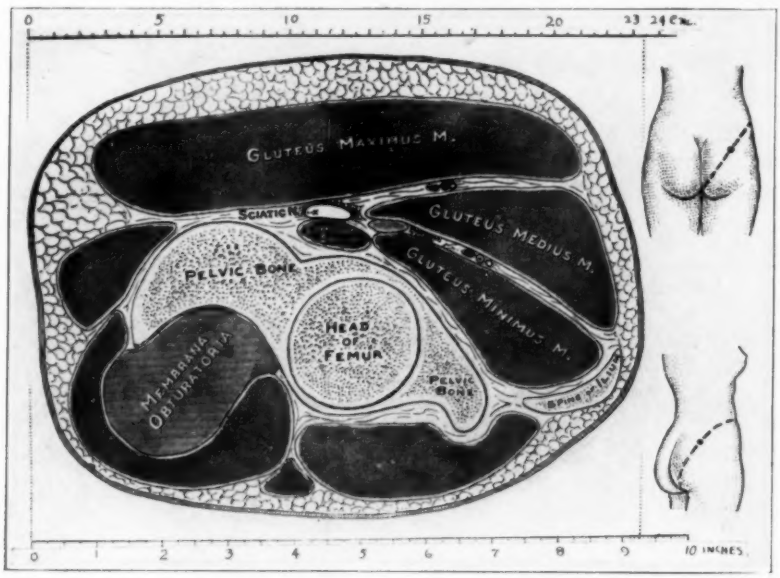

Fig. 5.—Cross-section through the hip.

good impression of the bulk of these muscles. In the area midway between the great trochanter and the crest of the ileum and 1 to 2 inches (2.54 to 5.08 cm.) medially, a needle may be plunged to a depth of from 3 to 4 inches (7.62 to 10.16 cm.) entirely within muscular tissue and not endanger any important structures. From an anatomic standpoint, this should be an ideal site for injections. Such injections, however, when tried on patients proved to be much more painful than injections within the substance of the gluteus maximus. This can probably be explained by the smooth muscular character and lack of fascial septums in these muscles, which tends to keep injections sharply localized, causing thereby disruption of muscular tissue and greater tendency to leakage backward along the needle track into the inter-

muscular space just described. These muscles also play a greater part in the ordinary movements of bending, stooping, climbing stairs, etc., from which patients commonly complain.

THE DISPERSION OF INTRAGLUTEAL INJECTIONS AS REVEALED BY THE ROENTGEN-RAY EXAMINATION

As previously stated, the study of such dispersion on cadavers did not prove satisfactory. By injecting substances opaque to the x-ray into patients it was felt that an ideal method would be at hand for the study of the dispersion of intragluteal injections. Cole [4] and his co-workers have followed the rate of absorption of mercury and bismuth by this means, but did not make any comment on their dispersion.

Because of the clearcut shadows thrown by iodized oil in its general use in roentgenography, and its similarity in viscosity with oily suspensions commonly used in intragluteal injections, it was felt that this oil would make an ideal medium for the purpose. As the patients used for this study were syphilitics and had been treated previously with iodides, iodism was not feared. There was practically no local reaction when the oil was used, but the precaution was taken to avoid its use in cases in which insoluble mercury had been given for a period of at least three months prior to these treatments, lest mercuric iodide might be formed and cause acute irritation.

The early roentgenograms were taken with the patients lying on their backs on a Bucky table and turned slightly toward the side in which the injection had been made. Later pictures with the needle in place were taken in the reverse position; it was not felt necessary to take them from varying angles because of the nature of the dispersion.

As previously suggested, it was felt that muscular movements, gravity and other factors might influence the dispersion of materials that had been injected. Roentgenograms were therefore taken after injections of 1 cc. of iodized oil at varying intervals up to one week. No such movement could be detected. They tended to remain in the same position with little extension after the first few minutes. Figure 6 shows roentgenograms taken immediately after the injection of 1 cc. of iodized oil and injections taken after an interval of one week. There is no change of position in the second x-ray film; it shows, however, rapid absorption.

A similar study using bismuth salicylate in oil, although throwing a less sharpcut shadow, gave the same results (fig. 7).

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4. Cole, H. N.; Littmann, S., and Sollmann, T.: Study of Mercury Injections by Means of Roentgen-Ray, J. A. M. A. **75**:1559 (Dec. 4) 1920. Cole, H. N.; Farmer, H. L., and Miskdjian, H.: Intramuscular Absorption of Insoluble Bismuth Compounds as Revealed by the Roentgen Ray, Arch. Dermat. & Syph. **13**: 219 (Feb.) 1926.

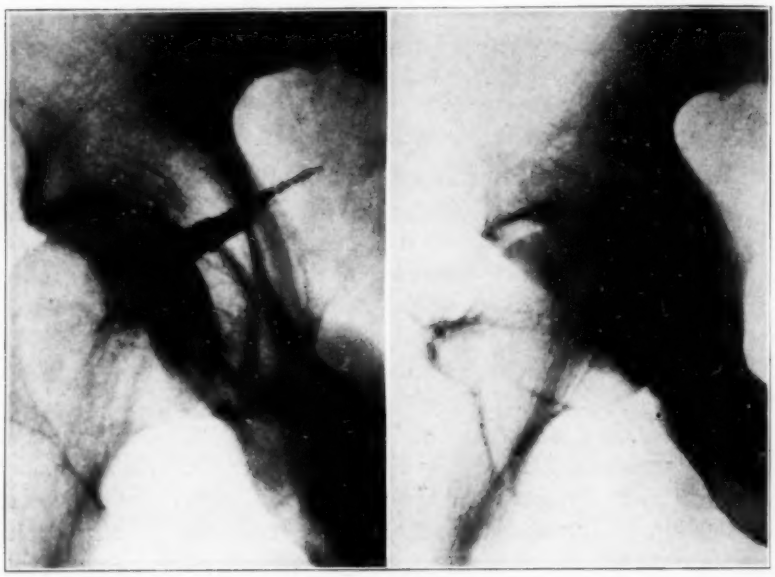

Fig. 6.—Roentgenograms taken immediately after an injection of iodized oil, and after an interval of one week.

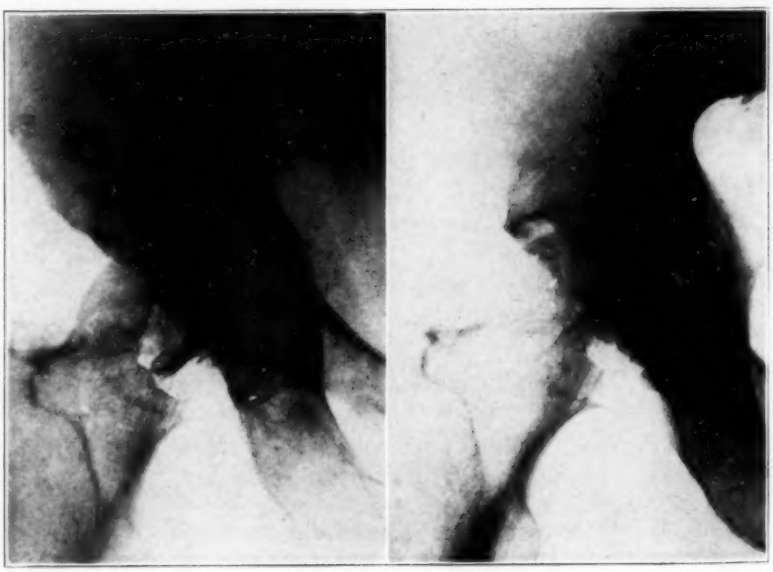

Fig. 7.—Similar results obtained after injection of bismuth salicylate.

In taking these roentgenograms, my associates and I were surprised at the unusual length of some of the injections and their tendency to a curved linear distribution. It was at first felt that this might be explained on a basis of leakage along the needle track, but this was readily disproved in the later work by leaving the needle in place (fig. 8). If one bears in mind the origin and insertion of the gluteus maximus together with its curved contour, the arcs are readily explained. The striking thing is their linear distribution. The injected material is closely confined to the fascial planes or coarse fasciculi into which this muscle is divided.

An endeavor was made to find an aqueous solution which would cast a clearcut shadow. Aqueous solutions of both mercury and bismuth failed to cast clearcut shadows when used in concentrations employed

Fig. 8.—Results of injections of iodized oil.

for clinical use. A bismuth solution cast a fairly clearcut shadow when used in double its recommended concentration (fig. 9). A suspension of metallic bismuth in isotonic dextrose solution was tried and gave excellent results with sharp detail. The viscosity of this solution is near that of aqueous solutions. It was felt that it should give more rapid and widespread dispersion.

Injections of metallic bismuth in isotonic dextrose solution showed excellently the fascicular distribution in the gluteous maximus. They extend in many cases as a narrow band from tendinous origin to tendinous insertion of the muscle. That these are not artefacts is best proved by those roentgenograms showing the needle in place (fig. 10). Such injections are closely confined to the fascial planes of the muscle, however, and fail to show diffuse dispersion as suggested in reported work on animals.

A fluoroscopic study was made to follow the rate of dispersion. These studies were not entirely satisfactory because of lack of finer detail. They did show, however, that viscous materials, such as iodized oil, tend to disperse more slowly than aqueous suspensions (metallic bismuth in dextrose). Oily suspensions tended to form a ball-like deposit about the point of the needle and then spread out more slowly

Fig. 9.—Results of an injection of soluble bismuth in double concentration.

and not so extensively along the fascial septums. Extension continued for from one to five minutes and then seemed to remain fixed. With the metallic bismuth suspension, the bismuth was distributed rapidly and had spread to its final confines almost as soon as the injection was completed.

In these studies it was expected that leakage backward along the needle track would be a common occurrence. Such was not my expe-

rience although about forty roentgenograms were taken. That it does occur in practice is proved by the occasional appearance of material which has been injected at the site of the skin puncture wound after withdrawal of the needle. That it was not a frequent occurrence was probably due to the merits of the advocated technic of injection. I have always felt that such leakage was an important factor in the formation (particularly in obese women) of painful subcutaneous nodules with their later formation of soaps as explained by Audry.[5] Figure 11 was obtained by using a large needle (20 gage) and withdrawing it quickly on completion of the injection, without making any special effort to secure the valve action of the skin by pulling it to one side prior to injection. The original x-ray film, particularly when taken

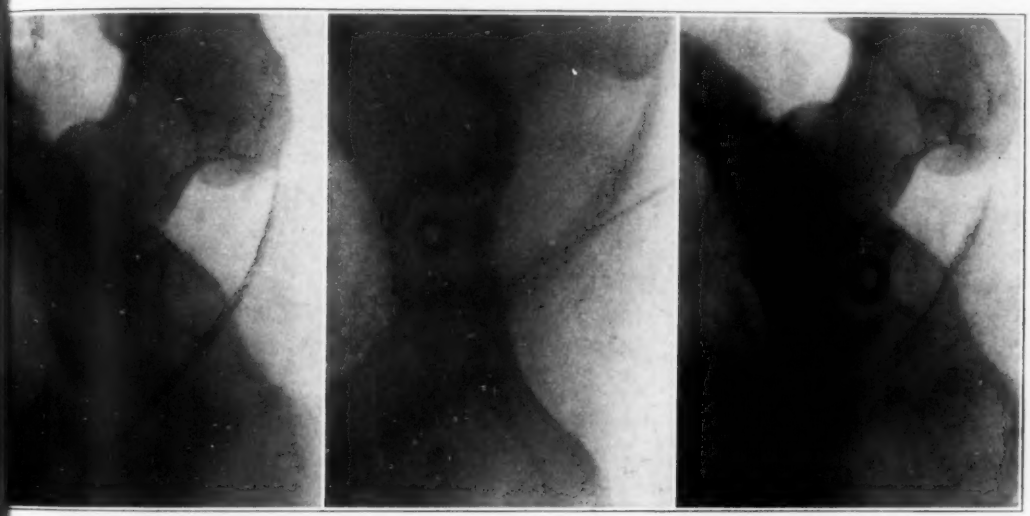

Fig. 10.—Results of injection of metallic bismuth in isotonic dextrose solution.

after the injection of iodized oil, shows clearly the point of injection slightly within the gluteus maximus muscle, the line of leakage with its collection into a ball-like deposit in the fatty superficial fascia and extension of the jaggy line of leakage to the skin surface.

It would seem from these observations that such leakage may be prevented by using the smallest needle consistent with safety and the viscosity of the material injected, by making the injection well within the substance of the muscle; by securing the valve action of the skin and superficial fascia by pulling it to one side prior to injection, by leaving the needle in place for a short time after the injection is completed to seal the injected material within the muscle and allow

5. Audry, C.: Bull. Soc. franç. de dermat. et syph. **33**:36, 1926.

for dispersion of the fluid before its withdrawal, and finally by applying pressure with a cotton pledget over the site immediately on withdrawal of the needle.

Von Oettingen, Todd and Sollmann,[6] in a recent publication, studied the spreading and absorption of bismuth introduced by intramuscular injection into rabbits and cats. They stated that "radiograms show that the greater part of the injected fluid does not remain within the muscle but that it flows back along the track of the needle to spread more or less in the cellular tissue between the muscles. Injections are therefore intermuscular rather than intramuscular. The degree of

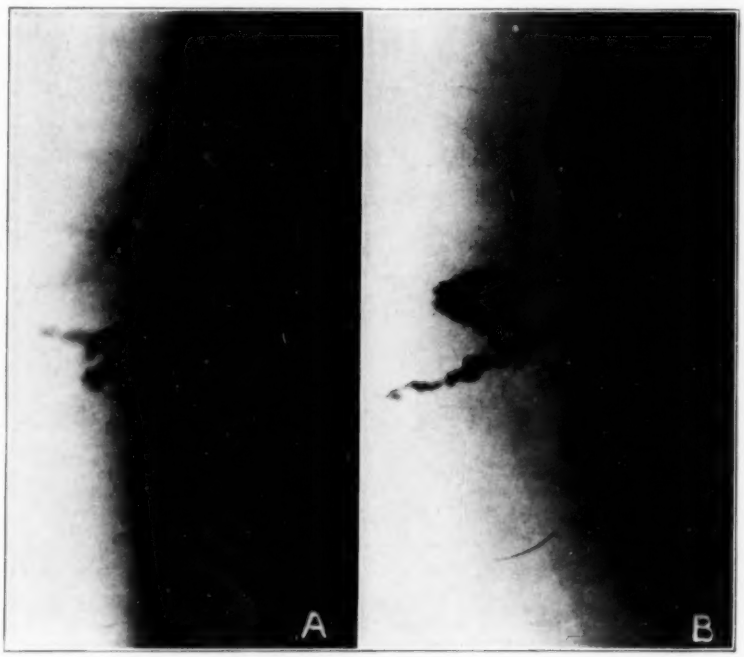

Fig. 11.—Subcutaneous nodule formation. *A* shows the appearance after an injection of bismuth salicylate and *B*, after an injection of iodized oil.

spreading is much greater for solutions than for suspensions and it is greater also for watery suspensions than for oily suspensions." My observations are confirmatory of this belief if the anatomic features of the gluteus maximus muscle are borne in mind. Because of the fascial septums this great muscle really consists of a bundle of numerous small muscles each with its sheath, similar to the small muscles of the thigh of the rabbit or cat. Injections within its substance do not remain

6. Von Oettingen, W. F.; Todd, T. W., and Sollmann, T.: J. Pharm. & Exper. Therap. **32**:67 (Nov.) 1927.

intramuscular but spread along the fascial septum or are intermuscular, if one wishes to call it so. They are, however, more narrowly confined because of the character of the fascial divisions.

I have been able to demonstrate this distribution clinically on a patient who has recently lost about 80 pounds (36.3 Kg.) in weight leaving the buttocks practically devoid of subcutaneous fat. Several days after an intragluteal injection of bismuth salicylate it may be felt through the thin flabby skin as a slightly indurated but practically painless area running like a piece of rubber tubing in the direction of origin and insertion of the gluteus maximus muscle.

When the needle point is in the central portion of one of the muscular fasciculi into which the gluteus maximus is divided, it is probable that the material which is injected breaks through the muscular tissue to the surrounding fascial sheath, which it then follows. When aqueous solutions are injected intragluteally one frequently feels a sense of resistance on the plunger of the syringe until a few minims are injected and then this is suddenly released; the rest of the injection is given without resistance. I feel that this is a clinical demonstration of such rupture. Wechselmann [2] endeavors to have his needle point on this fascia at the time injection is begun, but his tests and signs are not practical in a simplified technic. I hardly feel that they are necessary because of the observations and reasons enumerated.

Because of the thin character of the superficial fascia over the gluteus maximus it would be practically impossible to make an injection that would be confined within this fascia without injecting through it and thus having it confined by the fascia to its under surface. The freely movable loose subcutaneous fatty tissue of the buttock comes in abrupt contact with the thin superficial fascia of the gluteus maximus with little intervening connective tissue. Because of this and the tendency of oily suspensions to form a ball-like deposit about the point of the needle on account of their viscosity, I feel that such injections when deposited on the surface fascia of the gluteus maximus would not spread out as a thin sheet over the fascia, but form circumscribed deposits in the subcutaneous fat with slow absorption (fig. 11). For this reason I cannot subscribe to a true epifascial (deposited upon) technic for oily suspensions.

Anwyl-Davies [7] advocated such an injection, which he speaks of as "deep subcutaneous," for bismuth. It must be recalled that he is using aqueous suspensions of bismuth and injecting with a long needle at a decided angle to the surface. It is probable that such injections, with aqueous solutions and suspensions (because of their low viscosity and rapid dispersion), spread as a thin film over the surface of the

7. Anwyl-Davies, T.: Lancet **212**:148 (Jan. 15) 1927.

superficial fascia, explaining the success of this technic. Both of these contentions remain to be proved and, since they did not come within the subject matter of this paper, will be made the aim of a future study.

It was not my purpose in writing this paper to become involved in the technical phases of intramuscular injection or to outline such a technic. This has been so admirably done by Stokes [1] that it needs little elaboration. With his technic as a foundation I would add the anatomic features brought out in this study. A glance at figure 4 will show that the upper outer and lower inner quadrants of the buttock are the areas of election for injection. Because of the pain from the pressure of sitting, the upper outer quadrant is the area of choice. Any injection made within the area shown in this figure is satisfactory. A fairly large area is frequently necessary in placing the injections in order to avoid any previous indurations. I do not feel that the angle at which the needle is placed makes any particular difference, so long as the point falls within the desired area and depth. The aim in depth should be the center of the gluteus maximus; if too superficial, leakage into the subcutaneous tissue is favored, if too deep the large veins running near the under surface of the muscle are endangered. Injections passing entirely through the muscle should be avoided for reasons previously enumerated. The factors affecting depth (thickness of adipose tissue and muscular development) have been discussed. With experience one can sense the difference in resistance on entering the superficial fascia. The needle should then be advanced from ½ to ¾ inches (12.7 to 19.05 mm.).

CONCLUSIONS

The gluteus maximus muscle consists of a bundle of numerous small muscles divided by septums of gluteal fascia and bound loosely into a whole by this fascia. It thus offers special anatomic features to local injections.

Injections into the lower central portion of the buttock endanger the greater sciatic nerve, if they extend through the gluteus maximus muscle.

The more common and temporary sciatic-like pain extending down the back of the thigh is probably produced by irritation of the small sciatic nerve which lies immediately over the great sciatic nerve in this area. Any injection deposited within the space between the gluteus medius and maximus muscles may spread to produce irritation of this nerve.

Injections made deeply into the gluteus medius or minimus muscles are not well tolerated.

Roentgenograms taken at intervals up to one week after injections of iodized oil and bismuth salicylate fail to show dispersion of the fluid

after the first few minutes. These roentgenograms show that such injections have a curved linear distribution when injected within the gluteus maximus, being closely confined to the coarse fasciculi into which this muscle is divided.

Injections of a suspension of metallic bismuth in isotonic dextrose solution gave excellent results in the roentgenograms and showed the same or even a more sharply confined linear distribution.

Fluoroscopic study showed that oily suspensions spread rather slowly in from one to five minutes, depending on their viscosity, but that aqueous suspensions disperse to their final confines almost at once.

Leakage backward along the needle track with subcutaneous nodule formation can be prevented readily by using a small needle; by pulling the skin and subcutaneous fat to one side prior to injection; by making the injection well within the gluteus maximus; by leaving the needle in place a few moments on completion of injection, and by applying pressure with a cotton pledget immediately on its withdrawal.

Any injection deposited within the gluteus maximus muscle will rupture to and follow the nearest fascial septum. Such injections are therefore fascial as well as intramuscular.

Injections of oily substances should be given intragluteally, since this method favors both dispersion and absorption. In contrast, however, it is probable that aqueous solutions and suspensions disperse widely when deposited on the superficial fascia (epifascial).

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DISCUSSION

DR. HARRY G. IRVINE, Minneapolis: In many respects, possibly, one's reaction is that this paper is rather elementary. In theory everyone should be familiar with the anatomy, but from a practical point of view I am sure the paper is of great value. Many of us have forgotten some of these things. We teach students that injections should be made into the buttocks, without any careful explanation as to where or why. This paper correlates the anatomy and technic of the injections, and is therefore valuable. One point which should be emphasized in connection with all intragluteal injections is that one of the fundamental principles in the treatment of patients who have syphilis is to keep them under careful control. It is impossible to cure patients if they do not appear regularly for treatment. I think we should assume some of the responsibility for seeing that the patient does come. It is important to avoid unnecessary pain. Probably all of us have seen patients go from one physician to another because of the pain caused by the injections. This often occurs in clinics where injections are given by students or novices. The dangers of embolism are known to all of us, and while it occurs infrequently, it must be considered with every injection. During the past year, Gammel called attention to the danger of injecting some of the bismuth into the deep arteries and their ramifications in the superficial arteries of the buttock. I have seen one such case and Gammel reports three. Some cases have also been reported in the foreign literature. This is serious from the standpoint of disability to the patient. When material penetrates into the superficial arteries of the skin it causes a slough which requires several months to heal. In the mean-

time, the patient suffers great pain and is prevented from working. I wish to emphasize the two points of avoiding pain and of using care if the occasional occurrence of embolism is to be avoided.

Dr. George M. Olson, Minneapolis: In the epifascial or epiaponeurctic injection, as used in the Wechselmann Clinic, neoarsphenamine is deposited on the fascia. The needle is plunged into the buttock, and one can determine whether or not the point of the needle is on the fascia by scratching. A second method of determining this consists in the injection of 1 cc. of saline solution. If the needle is on the fascia, the saline solution bubbles back through the needle when the syringe is detached. If the point of the needle is in the muscle, the saline solution remains in the muscle.

Dr. Paul A. O'Leary, Rochester, Minn.: I was glad to hear Dr. Shaffer say that epifascial injections were easy to attempt but difficult to make, because my own experience confirms this. His anatomic demonstration emphasized an important point when he called attention to the vascularity of the inner half of the buttock, and the possibility of thus increasing the hazard of pulmonary embolism by giving intramuscular injections in the inner quadrants.

Dr. Shaffer: My reason for giving this rather elementary paper was to make clear the distribution of intramuscular injections. I have been unable to find any experimental data covering this subject in man. Even the advocates of the epifascial technic fail to make clear either the desired or actual distribution of such injections. In following the original signs of Wechselmann, I cannot see why they cannot all be fulfilled by having the point of the needle on or near one of the interfascial divisions of the muscle as well as on the superficial fascia.

ETIOLOGY OF ALOPECIA AREATA

WITH SPECIAL REFERENCE TO THE EFFECT OF EXPERIMENTAL NERVE INJURIES *

CARROLL S. WRIGHT, M.D.

WITH THE TECHNICAL ASSISTANCE OF MALCOLM J. HARKINS, V.M.D.

PHILADELPHIA

Two theories have been offered to elucidate the nature of alopecia areata. Perhaps the oldest theory is that it is a trophoneurosis. In 1847, Casenave associated alopecia areata and vitiligo together and believed both to be of nerve origin. In 1856, Baerensprung affirmed Casenave's idea that alopecia areata was of nerve origin, and this theory was later supported by Hebra and Kaposi in Vienna, Erasmus Wilson in England and Duhring in the United States. With the coming of the bacteriologic era in the latter part of the nineteenth century the theory that the disease might be of infectious origin gained in favor. This idea was given considerable support by the reporting in the literature of numerous epidemics of alopecia areata in schools. Bowen,[1] in reviewing epidemics reported by Fox, Dreuw, Haldan Davis and himself, came to the conclusion that these epidemics were probably not the same as the sporadic form of alopecia areata, varying from it in the small size of the bald areas and their jagged, angular appearance. In reviewing the literature of some of these epidemics we are of the opinion that the condition corresponded more to the pseudopelade of the French.

Jacquet,[2] in 1902, suggested the theory that alopecia areata occurs as a result of reflex irritation of a nerve root from defective teeth. This view has many adherents, although nasopharyngeal disorders and defective vision have been added to the possible sources of reflex irritation by later writers.

The trophoneurotic theory was given its greatest stimulation through the experiments of Joseph[3] who claimed that sectioning of the pos-

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* From the Research Institute of Cutaneous Medicine.

1. Bowen: Epidemic Alopecia in Small Areas in Schools, J. Cutan. Dis. **33**: 343, 1915.

2. Jacquet: La Pelade d'origine dentare, Ann. de dermat. et syph. 1902, p. 362.

3. Joseph: Experimental Untersuchunges über die Etiologie der Alopecia Areata, Monatsh. f. prakt. Dermat. **5**:483, 1886; Zür Etiologie der Alopecia Areata, Zentralbl. f. d. med. Wissensch. **24**:178, 1886.

terior root of the second cervical nerve peripherally to the ganglion or extirpation of the ganglion in cats or rabbits causes an alopecia similar to alopecia areata in man. He observed that about seven days after the operation coin-sized patches of loss of hair appeared on the back of the scalp and over the muscles of the ear. Disturbances of the local circulation were not noticed, and Joseph believed that the fall of hair was due solely to severing of the nerve nutrition to the areas. These experiments were repeated by Mibelli [4] who partially substantiated Joseph's observations. On the other hand, Behrend [5] and Samuel [6] repeated these experiments but with negative results. It was the belief of Behrend and of Samuel that the localized alopecia produced by Joseph was a result of injuries to the skin in connection with the operation.

In 1926, the attention of one of us (C. S. W.) was attracted to the work of Dr. Temple Fay,[7] neurosurgeon to the Episcopal Hospital and Philadelphia General Hospital, who sectioned various nerve roots to relieve the pain of incurable cancer of the head and neck. A certain aspect of Fay's work duplicated in human subjects the experiments which Joseph performed on cats, and it was felt that this would be an unusual opportunity to judge the effect of neurotrophic disturbance on the growth of hair.

Fay's first operation consisted in cutting the sensory supply to the involved areas of the face and neck. There are case reports in the literature indicating that patches of loss of hair may result from direct injuries to the nerves. Pontopiddian [8] observed circumscribed fall of hair after the removal of a tumor in the carotid region in which the first cervical nerve was cut. Askansy [9] reported a case in which several nerve branches were cut during the extirpation of a tumor from the neck and an alopecia developed on that side. Remy [10] observed an

4. Mibelli: Sulla Alopecia Areata, Tr. Monatsch. f. prakt. Dermat. **32**:231, 1901.

5. Behrend: Ueber Nervenläsion und Haarausfall mit Bezug auf die Alopecia Areata, Arch. f. path. Anat. **116**:173, 1889.

6. Samuel: Ueber Dr. Max Joseph's "Atrophiscken Haarausfall," Virchows Arch. f. path. Anat. **114**:378, 1888.

7. Fay: The Surgical Relief of Pain in Deep Carcinoma of the Face and Neck, Am. J. Roentgenol. **14**:1, 1925; Cervical Rhizotomy for Pain in Carcinoma of the Neck, Surg. Gynec. Obst. **53**:366, 1926; Observations and Results from Intracranial Section of the Glossopharyngeus and Vagus Nerves in Man, J. Neurol. & Psychopath. **8**:110, 1927.

8. Pontopiddian: Ein Fall von Alopecia Areata nach Operation am Halse, Monatsch. f. prakt. Dermat. **8**:51, 1889.

9. Askansy: Casuistisches zür Frage der Alopecia neurotica, Arch. f. Dermat. u. Syph. **22**:523, 1890.

10. Remy, quoted by Pohlman: Arch. f. Dermat. u. Syph. **114**:633, 1913.

alopecia areata after the extirpation of a piece of the frontal nerve (a branch of the first division of the trigeminus) 1 cm. in diameter. Numerous examples of so-called alopecia neurotica, in which patchy loss of hair resulted from direct injury or severing of nerves, are to be found in the literature, suggesting that interference with nerve supply to hairy parts may cause a localized fall of hair. Fay's early work consisted in sectioning the first, second and third divisions of the fifth nerve. Careful tests for anesthesia were made subsequent to the nerve sectioning, and in figure 1 are seen the areas supplied respectively by the first, second and third divisions of the trigeminal. The frontal portion of the scalp and the eyebrows are the hairy parts supplied by the first division; the upper lip, by the second division and the

Fig. 1.—Composite drawing (after Fay) showing the distribution of the branches of the trigeminal nerve and the second, third and fourth cervical nerves.

bearded region, by the third division. After sectioning the three divisions of this nerve, influence on the hair was not noted, but this was expected (in spite of Remy's observations) as previous observations, following sectioning of the root of this nerve as well as complete removal of the gasserian ganglion, had resulted in the conclusion that the hair was unaffected. In the course of further studies by Fay the glossopharyngeus and vagus nerves were also sectioned at their roots without influencing the hair in any way.

Pain not being relieved by this procedure, Fay's next step was to section the posterior roots of the second, third and fourth cervical nerves. This part of the study is of the greatest interest in considering Joseph's experiments. Laminectomy was performed, the dura opened

and the posterior roots thoroughly crushed and ligated. (Ligation was necessary to prevent postoperative bleeding from small vessels.) It was subsequently determined just which areas were made anesthetic by sectioning the posterior roots of these nerves. This is well shown in figures 1, 2 and 3. In figure 1, showing the area of anesthesia caused by sectioning of the posterior root of the second cervical nerve, the parietal portion of the scalp and the bearded region are seen to be

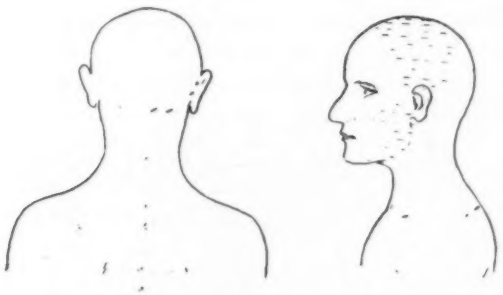

Fig. 2.—Area of distribution of the second cervical nerve.

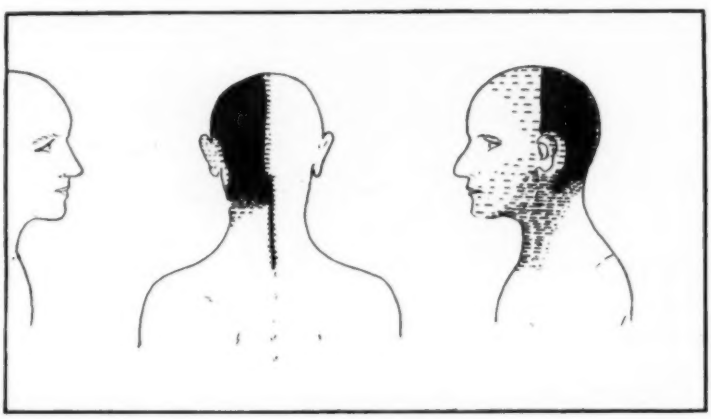

Fig. 3.—Area of distribution of the second and third cervical nerves.

supplied by this nerve. In a similar manner the distribution of the third and fourth cervical nerves was determined, and we found the three supplying the scalp and beard (with the exception of the mustache region) and overlapping each other and the areas supplied by the trigeminal. In one patient (figs. 4 and 5) the three divisions of the trigeminal and the second, third and fourth cervical nerves were also sectioned, and, as will be observed in the figures, there is no loss of hair in the scalp or bearded regions.

It is therefore shown that cutting off completely the sensory nerve supply to the scalp (and perhaps some vasomotor branches carried along with these nerves) does not cause a fall of hair, nor does cutting the posterior root of the second cervical nerve in man have any effect on the hairy parts of the head.

There remains then only the sympathetic nerve supply to the scalp to be considered. The sympathetic nerves have been under suspicion as playing a part in the causation of alopecia areata. In discussing the causation of syphilitic alopecia, Wile [11] stated that "loss of hair not infrequently occurs following injury to the cervical sympathetic nerves." The sympathetic nerve supply to the scalp is chiefly from the cervical

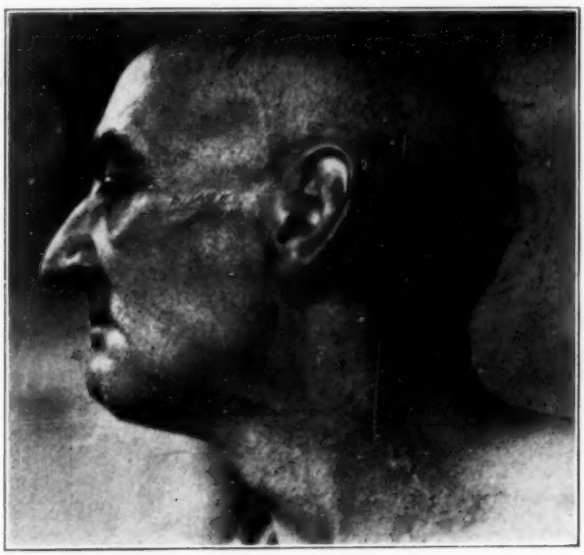

Fig. 4.—In this patient the posterior root of the trigeminal nerve and the posterior roots of the second, third and fourth cervical nerves are destroyed, the first cervical ganglion removed and the carotid artery stripped, cutting off all sensory and sympathetic supply to the scalp.

sympathetic chain and possibly to a slight extent from the sphenopalatine ganglion. In the patient whose photographs are shown and in whom the three divisions of the trigeminus and the posterior roots of the second, third and fourth cervical nerves were cut, Fay [12] next removed the sympathetic supply to the head after the earlier operations had failed to relieve the pain caused by the cancer. The sphenopalatine ganglion was entirely removed, the first cervical ganglion was removed from the cervical chain, and then in order that branches should

11. Wile, U. J., and Belote, G. H.: Syphilitic Alopecia, Arch. Dermat. & Syph. **13**:495 (April) 1926.

12. Fay: Unpublished Studies.

not reach the head the carotid artery was stripped of its sympathetic supply thus breaking every link with the chain of the cervical sympathetic nerves. This gave the desired effect of producing complete cessation of pain, but was without influence on the hair.

This cutting off of the entire sensory and sympathetic nerve supply to the hairy parts of the head by Fay in an endeavor to relieve the pain in patients with cancer possesses the value of a purposeful experiment and adds the final link to the chain of evidence that cutting off the innervation of the scalp fails to produce alopecia areata or in any way influence the hair. If this is true, then there is no justification for the use of the term trophoneurosis in connection with this disease.

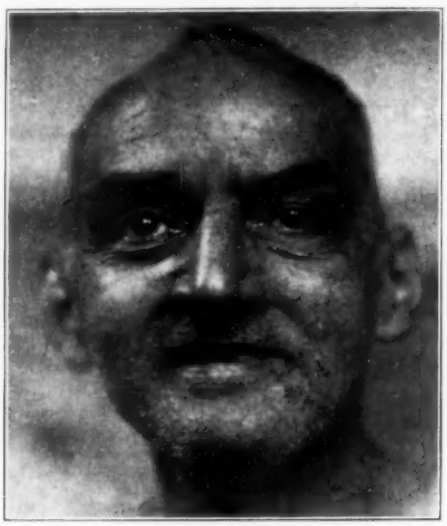

Fig. 5.—Front view of the same patient showing growth of the beard unaffected by cutting off of all the sensory and sympathetic nerve supply.

In order to clear up any doubt that cats or rabbits might react differently from human beings, the experiments of Joseph were repeated in part by us. The posterior roots of the second cervical nerves were sectioned peripherally to the ganglions in five cats and three rabbits and after a period of eight weeks effect on the hair had not occurred. The ganglions were not excised for, as stated by Behrend, in doing excision considerable traumatization occurs, but in cutting the nerve roots all possible nerve fibers are severed. Joseph's results are difficult of explanation, but in view of these observations and the observations of Fay on human subjects, we feel that something more than mere sectioning of the nerve root must have been responsible for the alopecia produced.

THEORY OF REFLEX IRRITATION

Having thus determined that interference with the sensory and sympathetic nerve supply to the scalp does not cause loss of hair, there remains only Jacquet's work to give any support to the so-called trophoneurotic theory. Jacquet's "Theorie dystrophique" represents alopecia areata not as a disease per se but as a reaction phenomenon or symptom. In his opinion this symptom indicates irritation of a nerve root from diseased teeth. The disease affecting the tooth supposedly irritates the nerve root, and this irritation spreads to the branch supplying an area of the scalp or beard; the disease of the tooth may be an abscess or just a simple caries, according to Jacquet. While this theory has won wide recognition with the inclusion of diseases of the nasopharyngeal

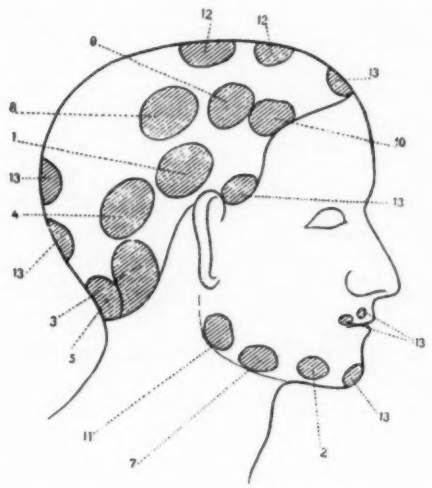

Fig. 6.—Areas of relative frequency of alopecia areata, according to Jacquet.

tract and of the eyes as possible sources of reflex irritation, there are a number of reasons for not accepting Jacquet's views as an explanation of alopecia areata.

In the first place, every one has diseased teeth at some time during life and usually many times. The innumerable instances of disease of the teeth is wholly irreconcilable with the rarity of alopecia areata. If only abscessed teeth or impacted teeth are considered capable of causing irritation of a nerve root, and caries and other simple diseased conditions of the teeth are omitted as causative factors, the number of cases that actually occur are many, many times greater than are cases of alopecia areata. Or, conversely, the number of cases of alopecia areata in which focal infection is not demonstrable should be considered. These cases must be explained.

Jacquet believes that areas of alopecia of the scalp correspond to nerve distribution. He furthermore claims that according to van Gehucten and Frohse there are certain areas insufficiently supplied with nerves and that these are easily affected by reflex irritation. As a matter of fact, the areas that Jacquet showed to be the most frequent sites of patches of alopecia areata are the most richly supplied by nerves as shown by Fay's work.

Jacquet's greatest error was his failure to view his own studies in the light of the studies of Henry Head (Bettman [13]). In figure 6 the areas of predisposition for patches of alopecia areata appear as outlined by Jacquet. About ten years previously, Head had so completely and thoroughly studied the relationship of reflex irritation from teeth of nerves supplying the skin that his work has been accepted as authoritative. The zones affected by the teeth are definite with each tooth, and are outlined by Head as follows:

1. The incisor teeth of the upper jaw act reflexly on the frontonasal zone of the scalp.

2. The canine and first bicuspids of the upper jaw act reflexly on the nasolabial zone.

3. The second upper bicuspid acts reflexly on the temporal or the maxillary zone.

4. The first upper molar acts reflexly on the maxillary zone.

5. The second molar and wisdom tooth of the upper jaw act reflexly on the mandibular zone.

6. The incisors, canine and first bicuspid of the lower jaw act reflexly on the chin.

7. The second lower biscuspid is doubtful. It apparently acts reflexly on the chin and the hyoid zone.

8. The first and second molars act reflexly on the hyoid zone.

9. The lower wisdom teeth act on the upper laryngeal zone of the neck.

The relationship can be readily seen in figure 7, and the reflex irritation from the teeth does not involve the scalp in a single instance.

From a glance at figure 6, representing the areas of predilection for alopecia areata according to Jacquet, and figure 7, representing the areas of Head in relationship to disease of the teeth, it is obvious that there is a striking incongruity.

It is true that in a certain percentage of cases of alopecia areata one or more abscessed teeth will be found (and it is of further importance that Head found that only involvement of the pulp-cavity could cause reflex irritation, caries causing only local pain). In a series of cases taken from the records of Dr. Schamberg and myself for the

13. Bettman: Ueber Beziehungen der Alopecia Areata zu dentalen Beizungen, Arch. f. Dermat. u. Syph. **70**:67, 1904.

past five years, abscessed teeth were found in only eleven of fifty cases of alopecia areata; this is not a larger percentage than one might expect in a similar number of controls. In two cases, these abscessed teeth were on the opposite side from the patch or patches of alopecia. In three cases only one abscessed tooth was found, while the alopecia areata was bilateral. In only one case did the infected tooth and the location of the patch of alopecia correspond to Jacquet's scheme. In a similar study of fifty cases, Jones [14] found that the fall of hair in alopecia areata does not correspond to nerve distribution.

Focal infections may play an important part in causing an alopecia areata to persist, but the evidence that this produces a reflex trophoneurotic change is insufficient. It is more likely that focal infections, when present, act just as they do in such dermatologic conditions as

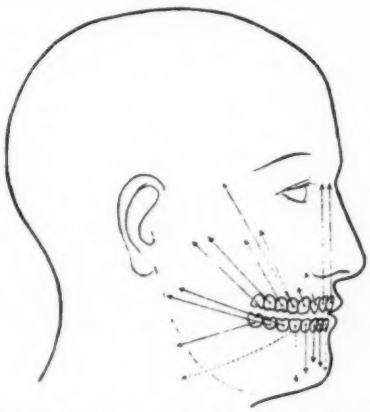

Fig. 7.—Schematic drawing (after Bettman) illustrating the area of reflex irritation from the teeth, according to Head. In no instance does reflex irritation from a diseased tooth affect the scalp.

furunculosis, eczema, lupus erythematosus, arsenical dermatoses and similar conditions, that is, as a general depressant to the economy or as a predisposing factor. In fact, Dr. Schamberg and I have not uncommonly found abscessed teeth in cases of premature alopecia in women, sometimes associated with a slight leukocytosis, and have observed improvement on removal of these foci.

If Jacquet's theory were to be accepted, it should be possible conversely to diagnose the source of the dental irritation from the location of the patch of alopecia.

COMMENT

The trophoneurotic theory of the causation of alopecia areata assumes that this condition is due to a lack of nerve nutrition to the hair

14. Jones: On Reflex Irritation as a Cause of Alopecia Areata, Brit. J. Dermat. **24**:362, 1912.

follicles. This theory was given its greatest stimulus by the experiments of Joseph, who claimed that when the posterior root of the second cervical nerve was cut peripherally to the ganglion, or when the ganglion was extirpated in cats or rabbits, a patchy loss of hair was produced comparable to alopecia areata in man. These experiments were partially confirmed by Mibelli, but others, notably Behrend and Samuels, failed to confirm Joseph's observations and expressed the belief that the alopecia was a result of the traumatization produced during the operation. Obviously, a paralleling of this experiment in man would be of infinitely greater value. In working out a plan for giving relief to patients with inoperable carcinomas of the head and neck, Fay cut not only the cervical nerves at the roots, but also the trigeminal, which also gives sensory branches to part of the scalp and beard, and eliminated the entire sympathetic supply to the hairy parts of the head. In not a single instance did a fall of hair occur, which would most definitely indicate that interference with the nerve nutrition of the scalp does not interfere with growth of hair.

From this it would be natural to assume that alopecia areata may result from an interference with the blood supply to a certain area or areas of the scalp, causing an ischemia for a sufficient length of time to interfere with the nutrition of the hair in that area. This thought is given support by the fact that stimulation of these bald spots by means of local irritants and ultraviolet ray, with resultant increase of vascularity, is the treatment most likely to bring about return of the hair. Ischemia of a part could result only from vasoconstriction and the cervical sympathetic nerve acts supposedly as a vasoconstrictor. Cutting off the sympathetic supply to the scalp, as performed by Fay, would either produce vasodilation or have a neutral action on the blood vessels and be without effect on the hair, but if one could but know what stimulates the sympathetic nerve, one might be nearer to the solution of the causation of alopecia areata.

The vasomotor disturbances occurring in Czerny's exudative diathesis of young children, the vasotonic symptom-complex of Hamberger in young adults, and the vagotonia of the blood vessels occurring in elderly men [15] may be summed up as vasoneuroses which manifest themselves as a regional paroxysmal anemia of the blood vessels of the brain, heart, face or extremities. While it is not the purpose of this paper to offer a new theory for alopecia areata, may we not suggest that the same regional vasomotor change may affect the scalp? One furthermore knows that regional vasomotor changes may cause pain in the

15. Eppinger, quoted by Higier: Vegetative Neurology, Washington, Nerv. and Ment. Dis. Pub. Co., 1919.

diseased part which, if this explanation were correct, would account for the occasional pain in areas of alopecia.

In recent years there has been a growing tendency to look on alopecia areata as due to irritative stimulation of the cervical sympathetic nerves. Levy-Frankel [16] stated the belief that syphilis, tuberculosis, trauma, intoxications, disturbances of the endocrine gland, and many other causes stimulate the sympathetic nerves and if this stimulation is sufficient, vasoconstriction of a branch artery may result with the production of alopecia in the area supplied by that branch. Of the endocrine disturbances he enumerates thyroid disease, ovarian disease, frigidity, hypophyseal disturbances and other conditions. Others, including Buschke and Peiser,[17] and Sabaraud,[18] are also leaning toward this view and particularly the possibility of endocrine stimulation of the sympathetic nerves. Obviously this is but a new line of thought and requires proof. One might as easily suggest that toxins act directly on terminal blood vessels causing vasoconstriction and loss of hair. In fact Sklarz [19] claimed that experimental stimulation of the upper cervical sympathetic nerve is without effect on the hair of the scalp.

CONCLUSIONS

1. Cutting the sensory nerves which supply the scalp in human subjects is without effect on the growth of hair.

2. Cutting the posterior root of the second cervical nerve in man is without influence on the hair of the head, although Joseph claimed to have produced alopecia in cats and rabbits by this procedure.

3. Cutting off the entire supply of the sympathetic nervous system to the scalp is without influence on the hair.

4. Jacquet's zones of reflex irritation from the teeth do not correspond to the zones as outlined by Head. Furthermore, if Jacquet's theory is correct, a much greater incidence of alopecia areata would be expected, in view of the extremely common prevalence of infections about the teeth.

5. Correlation of these facts indicates that alopecia areata is not a trophoneurosis. One is led to suspect that the patchy fall of hair is due to interference with the vascular supply, which in turn would result from vasoconstriction of a vessel or vessels supplying the scalp.

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16. Levy-Frankel: La pelade syndrome d'irritation vagosympathetique, Bull. Soc. franç. de dermat. et syph. **29**:93, 1922.

17. Buschke and Peiser: Zur Etiologie der Alopecia Areata, Dermat. Wchnschr. **80**:237, 287, 1925.

18. Sabaraud: Sur l'etiologie de la pelade, Ann. de dermat. et syph. **6**:177, 1920.

19. Sklarz: Zur Kenntnis der physiologie des Haut Sympatheticus, Dermat. Wchnschr. **73**:235, 1921.

ABSTRACT OF DISCUSSION

Dr. V. Pardo-Castello, Havana, Cuba: I wish to congratulate Dr. Wright on his excellent paper, and to call attention to a point that I think should be taken into consideration. We have all seen cases of extensive alopecia areata which respond well to thyroid therapy, and yesterday in my paper I suggested that preparations of thallium act on the thyroid gland, as shown by experiments on animals, producing a hypothyroidism of temporary character. Alopecia produced by thallium in these cases has a great resemblance, in my mind, to alopecia areata of the whole skull which is seen from time to time, not only because of the areas of alopecia but because of the trophic changes in the hair itself. I think changes in the activity of the thyroid gland may be responsible for some, if not all, of these cases.

Also, I wish to emphasize that the nerve supply of the thyroid gland comes from the sympathetic nerves and the second cervical ganglion.

Dr. James Herbert Mitchell, Chicago: I have had six patients with extensive alopecia in the last few months, and one or two with mild forms; in every one of these, the basal metabolic rate was at least 10+ and as high as 30+. Indiscriminate use of thyroid extract in alopecia areata might do much harm in such cases.

Dr. Frederick D. Weidman, Philadelphia: I have enjoyed this presentation, particularly because it indicates that dermatologists are alert to seize on newer procedures as they develop in other fields and to apply them to the dermatologic aspects of disease. The lower animals are peculiarly good objects of study in alopecia, because the alopecia is so obvious when it does occur. There are many reports in the veterinary literature showing that pressure on the nerves does cause total alopecia; carcinoma of the bladder in a cat has pressed on the spinal cord and induced alopecia of the hind quarter. I have been following cases of alopecia which have occurred among wild animals at the Philadelphia Zoölogical Gardens and have found that alopecia develops, as well as other things, in the gnu as the result of senile disturbance. We have seen alopecia develop in monkeys just a few weeks before pregnancy, and cease after the birth of the baby. We know that in hairless mice and rats (Schamberg has also had the same experience) in which the testes are atrophied, it is difficult to keep the strain breeding true in respect to alopecia. All this shows that there is no one cause for all cases. In some it is due to an endocrine disturbance, and in others to pressure on the nerves. We can never fasten any single cause on a disease like alopecia areata, in which the disease is referable to something which will interfere with the metabolism of the hair follicle and sheath. After that other things come in—clinical phases—such as distribution of the disease, and these are the things we will have to turn to if we are going to fasten any single etiologic factor on individual cases of this disorder.

Dr. Joseph V. Klauder, Philadelphia: In my clinic, a boy with complete alopecia had an unerupted molar tooth which, in accordance with the accepted belief as to the etiologic relationship, was ordered removed. After an elapse of some months, the boy revisited the clinic with a complete return of the hair. The patient was demonstrated as an instance of an unerupted molar tooth causing alopecia areata. I was subsequently informed, however, that the tooth was never extracted but that ultraviolet ray treatment had been given. The physician administering such treatments ascribed the return of the hair to this agent. I refrained, however, from drawing further conclusions. This experience emphasizes how unwise it is to make deductions solely on clinical grounds. How frequently the last therapeutic agent employed is ascribed as the cause of the disappearance of the disease. Every conclusion, whether it concerns clinical observation or laboratory experimentation, should be rigidly subjected to the principles of logic.

From a clinical and experimental visualization, it appears that alopecia areata is due to different causes and not to a single one. According to Max Joseph's experiments, nerve mechanism as the causation of the disorder cannot be excluded. Again, there is much evidence that mental stress and strain is another cause.

DR. DAVID KING-SMITH, Toronto: While out riding one day, a friend overtook me and I noticed at the root of the tail of his horse a gray patch of hair. The tail was partially paralyzed. I got in touch with the veterinary surgeon who stated that an operation had been performed on the tail of the horse during which the nerve was injured. Soon after the operation a patch of hair fell out and the new hair came in gray.

DR. CHARLES M. WILLIAMS, New York: I enjoyed the paper very much, particularly as it apparently limits our investigation of alopecia areata. I noticed that Dr. Wright explained the infected tooth as that of any factor that lowers bodily resistance. It has always seemed to me that in these cases the patients improve if any focus of infection is removed. On the other hand, I have had one patient with almost complete alopecia of the scalp, and the hair returned after a course of treatment with alpine light. Unfortunately, during the next summer he developed an acute infection, and the hair again fell out.

DR. LLOYD W. KETRON, Baltimore: No matter what the remote cause of alopecia may be, the direct cause is most likely an interference with the circulation. After using a depilatory on rabbits, especially if they are young and not in good physical condition, the hair frequently will not return for several weeks. In areas, however, in which an inflammatory reaction has been produced, the hair frequently returns promptly, most likely due to the increased blood supply. A similar phenomenon may often be observed in alopecia areata.

A short time ago, a little girl who had a total alopecia of the scalp was treated with a large dose of ultraviolet ray, only one application being made to the top of the scalp. There was a severe reaction over a palm-sized area on the crown. After this had subsided, the hair returned in this area alone, demonstrating forcibly the effect of irritants, and probably more important, increased circulation of the growth of the hair.

DR. WRIGHT: I thought yesterday when Dr. Pardo-Castello was discussing the thallium alopecia how closely the condition resembled alopecia areata, but it has been my understanding that one does not know just what causes the falling of the hair from thallium—whether it is due to an effect on the blood vessels, the nerves or what. I think the question of alopecia areata being due to interference with the vascular or the nerve supply could be settled by a simple little fact. Very simple proof of the failure of the cutting off of nerve supply to a hairy region to cause falling of the hair is seen in skin grafting. If Thiersch grafts are taken from a hairy part, the hair will continue to grow, in spite of the fact that every nerve to that piece of skin is cut and there can be no regeneration. The only possible nerves which could again become associated with that area of skin are the vasomotors, which are carried in with the new blood vessels. As the blood supply must be immediately reestablished if the graft is to be successful, it would appear that the nutrition of the hair also is dependent on the blood supply. If we take one of these small grafts and transfer it to another part of the body, the hair does not fall. This statement was made to me by a prominent Philadelphia surgeon. The life of the bit of skin depends on the establishment of an immediate blood supply. The vessels carry in the vasomotor nerves, but no other nerves regenerate. If it is true that the hair continues to grow in the Thiersch grafts in spite of the severance of all nerve supply, we have settled the question as to the importance of nerve or blood supply.

TULAREMIA *

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AND
LAURENCE R. TAUSSIG, M.D.
SAN FRANCISCO

The pioneer work [1] on the epidemiology of tularemia was carried out in California, and the causative organism was named [2] after one of the counties of the state. Infected rodents [3] have been found in many districts, but the literature does not contain the report of a single case in a person from California, with the exception of cases resulting from laboratory infections. We became interested in tularemia when we encountered a case referred to us from the neighboring state of Nevada. The occurrence of the primary lesion on the skin and the associated cutaneous eruptions are of sufficient importance to warrant including tularemia in dermatologic literature and textbooks.

REPORT OF CASE

History.—A well developed Spaniard, aged 39, reported to us on Aug. 16, 1927, complaining of general malaise and a sore on the left side of the neck posteriorly, with an associated enlargement of the adjacent lymph nodes. The family history was not important. He had been a sheep herder in Nevada for the past twenty years. His average weight was 180 pounds (81.6 Kg.), his weight at the time of examination, 155 pounds (70.3 Kg.).

The illness had begun about one month before examination when he noticed a small, hard, pruritic area on the left side of the neck. He scratched it frequently and finally "it came to a head and broke open." Three or four days after noticing it, he had a heavy feeling in the head, felt weak and drank considerable water. This continued for from five to six days. He improved for a day or two and attempted to return to work. The fever and general malaise returned and were just subsiding when he consulted us. He said that deer flies were prevalent at that time of the year (July and August) and that he had frequently been bitten by them. He did not, however, recall having been bitten on the neck recently.

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* From the Department of Dermatology, University of California Medical School.

* Read before the Section on Dermatology and Syphilology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. McCoy, G. W., and Chapin, C. W.: Bull. 43, Hyg. Lab. U. S. P. H. S., April, 1911; Public Health Bull. 53, Jan., 1912.

2. Francis, Edward: Pub. Health Rep. **36**:1731 (July) 1921.

3. Dieter, L. V., and Rhodes, B.: J. Infect. Dis. **38**:541 (June) 1926. McCoy and Chapin (footnote 1).

Physical Examination.—The examination revealed a healing ulcer with a clean base about 1 cm. in diameter on the left side of the neck posteriorly. Extending from the ulcer to the adjacent lymph nodes was a firm, cordlike band about the size of a slate pencil. The lymph nodes in the anterior cervical chain were enlarged from the posterior auricular area to the clavicle. They were slightly erythematous, firm, not fluctuant and not tender. The largest gland measured 5 by 7 cm. The lymph nodes elsewhere in the body were not enlarged. The temperature was 99 F. The results of physical examination were otherwise negative.

Laboratory Data.—Smears and cultures were negative. The Wassermann reaction of the blood serum was negative. The examination of the blood showed:

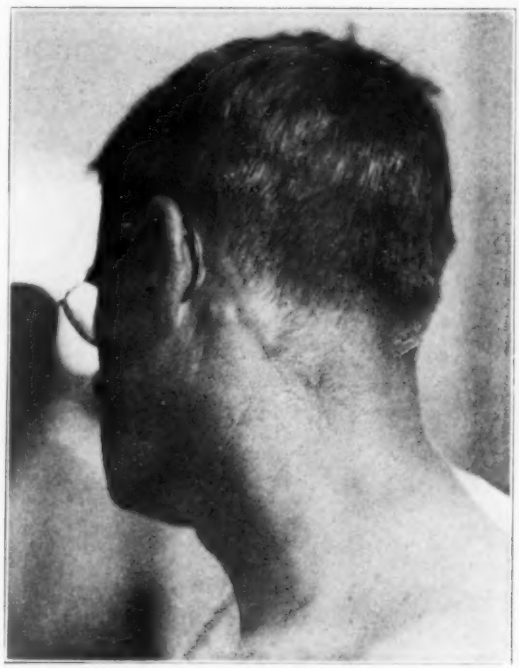

Fig. 1.—Scar from primary ulcer and enlarged lymph nodes.

hemoglobin, 75 per cent (Sahli); red blood cells, 4,960,000, and white blood cells, 6,560. The differential count showed: polymorphonuclears, 57; small lymphocytes, 20; large lymphocytes, 3, and large mononuclear leukocytes, 20. The urine was normal.

A roentgen-ray plate of the chest was essentially normal. Agglutination for tularemia (blood taken about six weeks after the onset of the disease) showed: *B. tularense* 1:160 +++, 1:320 ++, and *B. abortus* 1:80 +. The agglutination of the urine was negative for *B. tularense*. The precipitin was negative for *B. tularense*.

A firm lymph node was removed from just above the clavicle for microscopic examination. There were small areas of focal necrosis throughout the gland, showing a massing of endothelial cells, with giant cell formation. The micro-

scopic picture was similar to that seen in tuberculosis, but tubercle bacilli could not be demonstrated. A biopsy was not taken from the primary ulcer as it had entirely healed.

Course.—During the three weeks that we had the patient under observation there was little improvement in the general condition. The fever subsided on the second day. The wound from the removal of the lymph node healed per primum. Four lymph nodes softened and were drained during convalescence. The patient felt weak and tired and had just started to improve when he was sent home, two months after the onset of his illness.

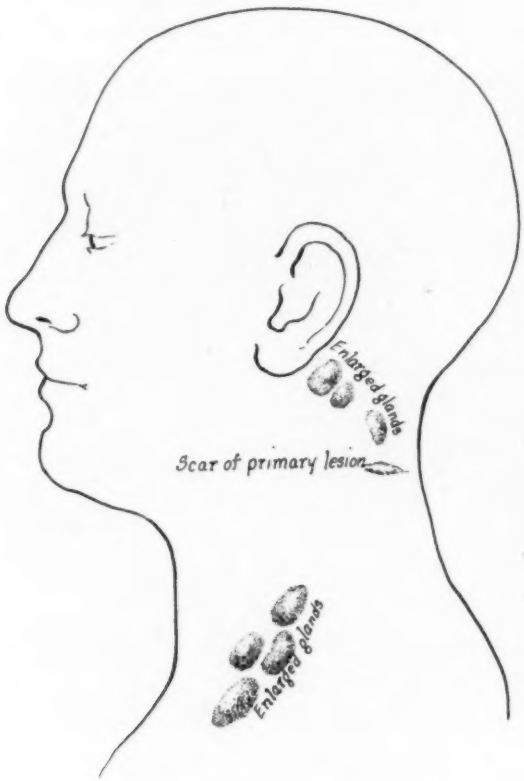

Fig. 2.—Diagrammatic sketch of observations not well shown in figure 1.

REVIEW OF THE LITERATURE

Bacterium tularense, the causative organism of tularemia, was first discovered, in 1911, by McCoy and Chapin [4] in the course of their investigation of a plaguelike disease of ground squirrels in the San Joaquin Valley of California. The name of the organism was derived from Tulare, the county in which the infected animals were found. A year

4. McCoy and Chapin (footnote 1, first reference).

before (1910), in Utah, Pearse [5] described a series of cases of "deer fly fever" which had been known among hunters for several years. It was not until 1919 and 1920 that Francis [6] and his associates demonstrated the causative agent of "deer fly fever" to be *Bacterium tularense*, which was transmitted from infected rabbits to man by the deer fly. In 1914, Vail [7] described a case of conjunctivitis in man from which *Bacterium tularense* was cultured. In 1921 [2] the first case due to handling

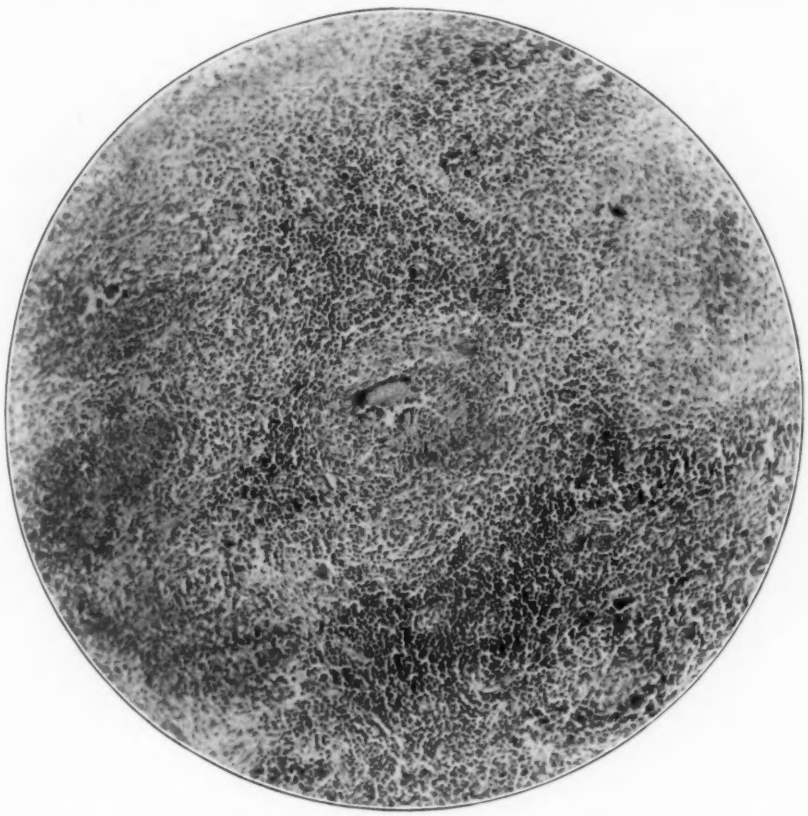

Fig. 3.—Low power magnification of lymph node, showing focal necrosis and giant cell formation.

infected rabbits was reported in Washington, D. C. Ohara's disease [8] in Japan was shown to be identical with tularemia. This is the only disease which has been worked out in its entirety in the United States.

5. Pearse, R. A.: Northwest. Med. **3**:81 (March) 1911.

6. Francis, Edward: Pub. Health Rep. **34**:2061, 1919.

7. Vail, D. T.: Ophth. Rec. **23**:487, 1914.

8. Francis, Edward, and Moore, Dunlop: Identity of Ohara's Disease and Tularemia, J. A. M. A. **86**:1329 (May 1) 1926.

DISEASE IN ANIMALS

In 1912, McCoy and Chapin [1] reported the disease in ground squirrels in California. Since that time it has been found to infect wild rabbits [9] (jack, cottontail and snowshoe), meadow mice,[10] wild rats,[3] coyotes,[11] gophers [12] and birds.[13] It is invariably fatal in animals. It is transmitted by the wood tick [14] (*Dermocentor andersoni,* Stiles) and the deer

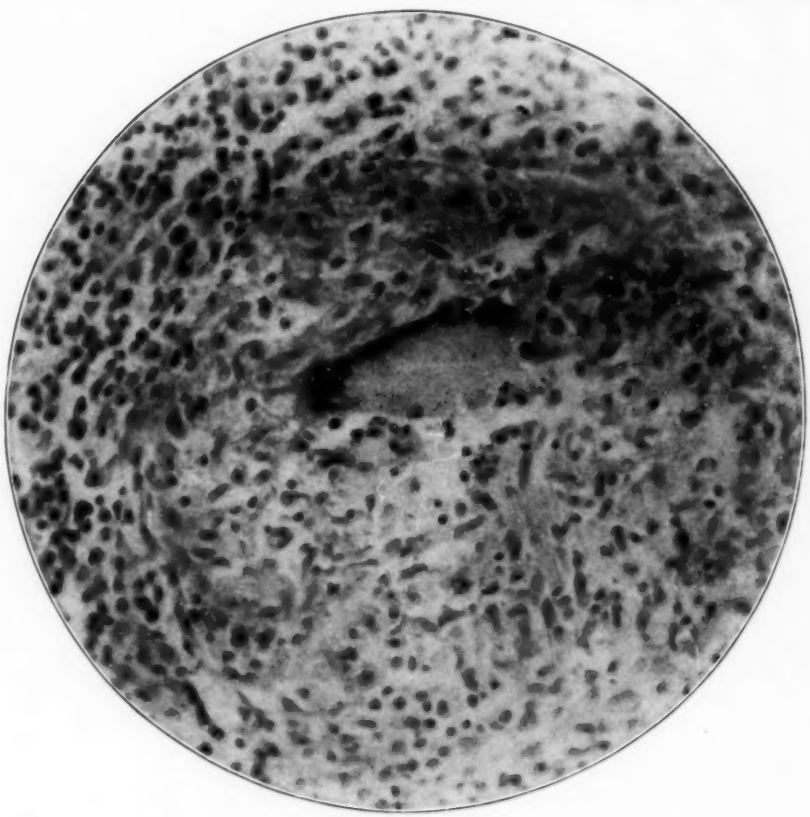

Fig. 4.—High power magnification of lymph node, showing focal necrosis and giant fell formation.

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9. Ohara, H.: Japan M. World **6**:263 (Oct.) 1926. Francis (footnote 2).

10. Perry, J. C.: Pub. Health Rep. **43**:260 (Feb.) 1928.

11. Parker, R. R., and Francis, Edward: Pub. Health Rep. **41**:1407 (July) 1926. Francis, Edward: Oxford Medicine, New York, Oxford University Press, 1926, p. 955.

12. Francis (footnote 11, second reference).

13. Green, R. G., and Wade, E. M.: Proc. Soc. Exper. Biol. & Med. **25**:515 (April) 1928.

14. Parker, R. R., and Spencer, R. R.: Pub. Health Rep. **41**:1403 (July) 1926.

fly [6] (*Chrysops discalis*). In wood ticks there is an hereditary transmission [14] of the disease through the eggs to the next generation. They therefore furnish a permanent source of infection. The deer fly generally remains infected for only from four to fourteen days. It has also been proved that the disease is transmitted by the bedbug [15] (*Cimex lectularius*), from one rabbit to another by the rabbit louse [2] (*Haemodipsus ventricosis*), between mice by the mouse louse [16] (*Polyplax serratus*) (*Burm*), and perhaps from rabbits to birds [13] by the rabbit louse (*Haemodipsus ventricosis*).

DISEASE IN MAN

The Public Health Department [17] reported 420 cases in the United States up to December, 1927. In the general literature, we have been able to find 241 reports of cases. The disease has been reported from every state except the New England States, New York, New Jersey, Delaware, Wisconsin and Washington. A number of cases have also been reported from Japan. Laboratory infections only have been reported from California. The State Board of Health, however, informs us that two cases were reported to them from Sacramento, Calif., in November and December, 1927. They were both infections from jack rabbits.

The greatest source of infection of the human being in the Mississippi Valley is from the dressing of wild cottontail rabbits for food. The disease is most prevalent during November, December and January, which is the "open season" for cottontail rabbits. The jack rabbit, which is found west of the Mississippi, is seldom eaten so is not often a source of infection. Many of the cases in the west result from tick or fly bites. The cases due to this source occur during the summer and fall at which time these insects are most active. Rabbits [17] killed with a club or brought in by a cat or dog are often sick rabbits and are a frequent source of infection.

BACTERIOLOGY AND IMMUNOLOGY

The causative organism of tularemia is *Bacterium tularense*, a small, gram-negative, nonmotile rod which can be grown on dextrose egg yolk or serum dextrose cystine agar; it does not grow on ordinary agar medium. The isolation of the organism in human beings is best affected by injecting macerated pieces of infected gland or pus subcutaneously into guinea-pig or rabbit. The animal dies within a week, and cultures may be obtained from typical white caseous areas in the spleen or liver.

15. Francis, Edward, and Lake, G. C.: Pub. Health Rep. **37**:83 (Jan.) 1922.
16. Francis, E., and Mayne, B.: Pub. Health Rep. **36**:1738 (July) 1921.
17. Editorial: Pub. Health Rep. **42**:2948 (Dec.) 1927.

In severe cases in human beings the blood is found to cause the disease when injected intraperitoneally into laboratory animals. Tularemia causes the formation of specific agglutinins in the blood in the course of a week, the serum agglutinating *Bacterium tularense* in very high dilutions. The agglutinins have been shown to remain in the blood for many years. As a rule, a single attack confers immunity. There is only one case on record in which the disease was contracted by one human being

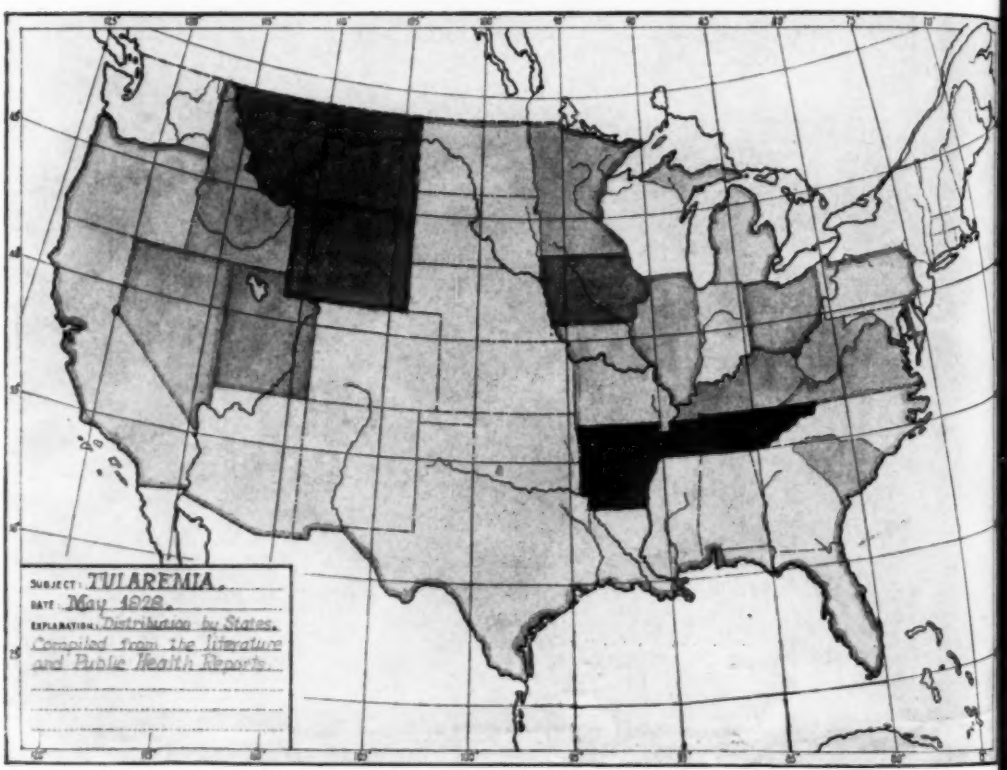

Fig. 5.—Distribution of tularemia by states as compiled from the literature.

from another. Laboratory animals have not been found to have any natural immunity, and the disease is regularly fatal among them.

PATHOLOGY

In guinea-pigs, rabbits, white mice and man, the outstanding pathologic changes are essentially the same. The liver and spleen are studded with white globular nodules that on microscopic examination are areas of focal necrosis. Microscopic sections of the primary ulcer and regional lymph nodes in man show a chronic inflammatory reaction not unlike that

found in tuberculosis.[18] There is an endothelial cell infiltration with an invasion of small lymphocytes, a few plasma cells and an occasional giant cell.

CLINICAL COURSE

Tularemia is characterized by the sudden onset of fever and is often ushered in with chills, malaise and headache. The incubation period is from two days to a week. The fever usually persists for several weeks, although there is often a recession after the first week and the second rise is not as great as the first. The temperature returns to normal by lysis. A moderate leukocytosis usually occurs, ordinarily not more than 12,000. The mortality is approximately 4 per cent. There are two general types of the disease, the typhoid and the ulceroglandular. The typhoid variety is encountered chiefly among laboratory workers. In this group, there is no primary lesion and the glands are not enlarged. There is, however, the usual long continued febrile course and the agglutinins are present. The method of entry of the organism in this type of infection is unknown. There are a number of subclassifications of the glandular type, all of which are essentially the same. There is a primary lesion at the site of the infection, varying in size from a small papule to a necrotic and indolent ulcer. This lesion may be caused by the contamination of an excoriation in handling infected animals, by the bite of a fly, or by the bite of the common tick. The usual site of the primary lesion is on the fingers, neck or conjunctiva. The adjacent lymph nodes enlarge and tend to break down. A lymphangitis radiating from the primary sore always occurs, and cutaneous nodules simulating sporotrichosis have been reported. General malaise often persists for a long time after the disease has run its course, similar to that following influenza and typhoid.

CUTANEOUS MANIFESTATIONS

The occurrence of the primary ulcer of tularemia on the skin is of dermatologic interest. Its clinical similarity to sporotrichosis is of importance in differential diagnosis.[19] Subcutaneous nodules with suppuration have been described occasionally by several authors.

The primary lesion of tularemia begins as a painful, firm, erythematous papule, the size of a lentil, which ulcerates, showing a necrotic center. In time this separates, leaving a punched-out ulcer about 1 cm. in diameter. It heals in about six weeks, leaving a soft, pliable scar, as

18. Netherton, E. W.: Tularemia with Reference to its Cutaneous Manifestations, Arch. Dermat. & Syph. **16**:170 (Aug.) 1927.

19. Hodges, F. C.: Am. J. M. Sc. **170**:57 (July) 1925. Permar, H. H., and Weil, G. C.: Am. J. Path. **2**:263 (May) 1926. Freedlander, S. O., and Grossberg, M. H.: Tularemia, J. A. M. A. **88**:475 (Feb. 12) 1927. Junkin, H. D.: Northwest Med. **26**:415 (Aug.) 1927.

seen after a furuncle. The lesion is distinguished from the primary lesion of syphilis by (1) the inflammation around it, (2) the lack of cartilaginous infiltration, (3) the necrotic center and (4) the presence of itching and pain.

Many nonspecific skin eruptions are described in association with tularemia. Erythema multiforme-like lesions,[20] pustular eruptions on the hands,[21] acne of the chest and back [22] and herpetic lesions [12] have been reported. It is safe to say that most of them are of toxic origin or the result of medication. From a review of all the cases reported in the literature, we do not believe that there is a specific skin eruption associated with this disease.

DIAGNOSIS

If one is familiar with the disease, it is difficult to confuse it with anything else. A history of contact with wild rabbits or exposure to deer flies or ticks, with the subsequent development of a chronic ulcer and an associated regional adenopathy and fever, is more than suggestive.

Tularemia should be suspected in every typhoid-like fever in which the result of the Widal test is negative, especially if the patient is a laboratory worker or handles rabbits or other rodents. Specific agglutination occurs with the serum after the first week. The diagnosis may be established by the inoculation of animals with material from the primary lesion or from the infected glands. In practice, the agglutination method is the most practical as it usually takes a week before inoculated animals die with the disease, and by that time the agglutinins have appeared in the serum of the patient. It is not possible to identify the organism from smears, and it is unusual to obtain a positive culture from material from human beings.

PROGNOSIS

Death seldom occurs in the ulceroglandular type of the disease. Of the cases reported that have ended fatally, most of the patients died of complications, i.e., pneumonia, chronic heart disease and exploratory laparatomy. In the oculoglandular type the prognosis is more grave.

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20. Maclachlan, W. W. G.; Fetter, W. J., and Cratty, A. R.: Two Cases of Tularemia, J. A. M. A. **86**:749 (March 13) 1926. Whiteis, W. R., and Anthony, E. J.: J. Iowa M. Soc. **16**:188 (April) 1926. Flick, J. B.: Ann. Surg. **83**:737 (June) 1926. Parker, R. R., and Spencer, R. R.: Pub. Health Rep. **41**:1341 (July) 1926. Rutledge, L. H.: Minnesota Med. **10**:97 (Feb.) 1927; A Fatal Case of Tularemia, J. A. M. A. **88**:788 (March 12) 1927. Netherton (footnote 18). Farrand, B. C.: Am. J. M. Sc. **172**:853 (Dec.) 1926.

21. Wallace, J. W.: J. Iowa M. Soc. **16**:302 (July) 1926. Farrand (footnote 20, seventh reference).

22. Ledingham, J. C. G., and Fraser, F. R.: Quart. J. Med. **17**:365 (July) 1924.

TREATMENT

The treatment is entirely symptomatic; rest in bed is important. Lymph nodes should not be excised, and incision should be resorted to only when there is a definite point of softening. Vaccine or serum therapy has not been satisfactorily perfected. Mercurochrome-220 soluble has been used locally and intravenously but has not been proved to be of definite value. Intravenous injections of arsphenamine have been used and quinine therapy employed.

PREVENTION

Prevention is a difficult task. Laboratory workers can wear rubber gloves, but it would be difficult to train cooks and hunters to do so. The safest procedure is not to eat or handle wild rabbits. The prevention of the infection from the bite of deer flies and ticks is difficult, especially in the case of ticks as the disease is transmitted through the eggs from one generation to another.

COMMENT

1. The occurrence of the primary lesion of tularemia on the skin makes the disease of dermatologic importance.

2. Specific skin eruptions probably do not occur in tularemia.

3. Tularemia is a rare disease in California. This is of interest in view of the fact that rabbits, ground squirrels and mice have been known to be infected in the state for many years.

4. A case of tularemia is reported in some detail. The disease was contracted in the State of Nevada, undoubtedly from a "deer fly" bite.

ABSTRACT OF DISCUSSION

DR. E. W. NETHERTON, Cleveland: An unusual feature of the problem is the large variety of insects and wild animals which may become infected with or harbor *Bacterium tularense*, and from which man may contract the disease. For this reason, preventive measures can be only partially effective. Fortunately, the disease is not contagious. Most of the cases have been of the glandular type, and an error in diagnosis would be unlikely, provided one keeps tularemia in mind. The fever which lasts two or three weeks, the development of the primary lesion, usually on the hand, arm or forearm, the conjunctivitis with ulceration and the accompanying persistent enlargement of the lymph glands, with the history of having prepared a wild rabbit, or of having been bitten by an insect, should arouse suspicion and justifies a tentative diagnosis of tularemia. In the typhoid-type of case, the diagnosis is not so easy. In those cases the history is of the utmost importance. Finally, the agglutination test will settle the question definitely. Francis has proved that the agglutination test is a reliable diagnostic procedure. In fact, it is the only practical laboratory test. Blood cultures and direct smears do not give information, and animal inoculation is undesirable because of the frequency of infection in laboratory workers. Blood for aggluti-

nation should not be taken before the second week. The dermatologic features of the disease are of special interest to our section. The initial lesion is unlike a chancre in that it is a punched-out ulcer which results from central necrosis. It is not indurated, the necrosis appearing quickly. There is no diffuse cellulitis or acute lymphangitis, such as is seen in streptococcic infection. The infected glands which show suppuration and discharging sinuses must be differentiated from tuberculosis, actinomycosis and other more familiar conditions. The subcutaneous nodules simulate sporotrichosis and the generalized eruptions, although not characteristic, must be differentiated from the exanthema, erythema multiforme and the like.

Dr. Edward Francis, Washington, D. C.: I am getting case reports of lesions all the time from various states, which are interesting to the dermatologist. These lesions are particularly the subcutaneous nodules and the skin eruptions. Subcutaneous nodules, some of which simulated sporotrichosis, were noted in 38 of 614 reported cases of tularemia. All were located on the upper extremity between the primary lesion on the fingers and the enlarged axillary lymph nodes, except that in one instance they were between the site of an insect bite on the knee and the enlarged lymph glands of the femoral triangle. The nodules were distributed not only along the vessels on the anterior surface of the upper extremity, but also over the posterior surface of the arm, forearm or hand. The nodules were firm and movable, sometimes tender and inflammatory, and about half of them ultimately suppurated. They varied in size from that of a pear to 1 cm. in diameter, and in number from one to thirty. The nodules usually appeared in the acute stage of the disease, but were also noted two months and even six months after onset. Crops or appearance at intervals has been mentioned. Purplish coloring of the overlying skin was sometimes noted. In cases in which tularemia was not borne in mind, these nodules were cultured for sporothrix.

Eruption of the skin was noted in thirty-two cases. In time of appearance, it usually coincided with the early stage of illness, but varied in first appearance from the fourth day to the sixth week. It lasted from a few days to seven, ten, twelve and fourteen days, and even three weeks. The distribution was bilateral on any part of the body, with the greatest incidence on the upper extremities, head and neck. It was macular, papular, pustular, maculopapular, papulopustular, blotchy or a rash. In some instances it was painful and inflammatory, but was usually painless and did not itch. Desquamation and pigmented remains have been noted. Many acne lesions developed on the back of the thorax during the illness in two cases. Extreme herpes was noted in one case. Jaundice was observed in one case.

Dr. George M. MacKee, New York: We are told that the disease is not common in the east, but that cases may occur. In fact, it is possible that cases have occurred and have been diagnosed as sporotrichosis, furunculosis, etc. The microscope shows a tuberculoid architecture which, of course, simply indicates a certain type of tissue reaction to polymorphous irritation. There are pathologists, however, who are likely to suspect tuberculosis when they encounter a tissue reaction of this kind. It is possible, therefore, that some cases of this disease in the past have been diagnosed tuberculosis.

Dr. Ralph T. Edwards, Elysian, Minn.: I have seen a patient with ulcer, adenopathy, urticaria and a little fever following a tick bite. The patient had been bitten twice; one bite produced an ulcer and the other did not. The constitutional symptoms did not incapacitate him from work. He claims that many persons in his neighborhood had been sick in the same way following tick bites.

In many diseases, deaths occur in three or four days, but there are milder and ambulatory cases as well. Why should we not find ambulatory cases of tularemia also? We should look for those cases and should keep a record of any case in which antibodies are formed in the blood. It was mentioned that every state should be prepared to make a diagnosis from the serum reactions. Minnesota is prepared, and if any one will send specimens of blood of persons in whom tularemia is suspected to the Bureau of Preventable Diseases, the specimens will be carefully examined.

Dr. Davis W. Goldstein, Fort Smith, Ark.: What precautions should be taken in order to prevent infection? Also, is there any protection against skin infection after the rabbit is prepared, and does cooking destroy the organisms?

Dr. Frank W. Cregor, Indianapolis: I have no doubt that we have a lot of tularemia in our state. Newspapers often report cases. Have the agglutinations been found specific for the disease?

Dr. Fred M. Jacob, Pittsburgh: There have been several cases in Pittsburgh and Dr. Francis has confirmed the diagnosis by agglutination in all of them. Permar and Bruecken have done some work with these cases, and I have been fortunate enough to see several of them and the records of others. As Dr. MacKee suggested, the insidiousness of this disease must be considered. This was demonstrated in Pittsburgh by a case of a woman who skinned rabbits about Christmas time, and three months later, following lobar pneumonia, she developed an axillary abscess. There was no skin lesion or scratch of any kind that she could remember, but she remembered that she had prepared the rabbits. A specimen of the blood was sent to Dr. Francis, and the diagnosis made. There was no growth on mediums, and no result from animal inoculation. About three months after she recovered from this attack, she came back with the diagnosis of uremia, on another service; she died from a streptococcic infection of the blood stream that was recognized by Dr. Bruecken on the autopsy table. The course of the disease was typical, showing the glandular lesions, similar to the acute type of tuberculosis, but the results of the tests and inoculations for tuberculosis were negative. Permar described the pathologic condition and stressed the endothelial proliferation and the tubercular character of the pathologic picture.

Dr. Paul A. O'Leary, Rochester, Minn.: I have seen seven cases of tularemia. In the differential diagnosis, the two diseases that may readily be confused with tularemia are sporotrichosis and inoculation tuberculosis of the skin. The primary lesion of inoculation tuberculosis with associated lymphangitis and bubo presents a clinical picture not unlike the early manifestations of tularemia, while the late phase of the disease with the nodules seemingly following the lymphatics resembles sporotrichosis. The agglutination test for tularemia now makes the diagnosis for us.

Dr. Samuel E. Sweitzer, Minneapolis: In reading of tularemia, I have been struck by the number of cases that have been observed for some time before the attending physician has thought of tularemia. In Minnesota several things have been thought of before it was decided that it might be tularemia and the history was taken. From the dermatologic standpoint, I wish to emphasize that if a patient with ulcer and adenopathy consults a physician, and if he is unable to make a diagnosis, an agglutination test should be made. This should be stressed for many of the doubtful cases are finally diagnosed by results of the agglutination test.

Dr. Laurence R. Taussig, San Francisco: In making the diagnosis of tularemia it is practically hopeless to attempt to obtain a positive culture from the lesions. Even if a special medium is used, the culture will be negative. Bacte-

riologically, the diagnosis can be made by injecting macerated tissue into laboratory animals, and cultures may be obtained from the organs when the animal dies. As Dr. Netherton pointed out, there is a good deal of danger of setting up a new focus of laboratory infections. It has been the experience of nearly all workers in laboratories handling this material to suffer a typhoid-like tularemia, and the danger is unwarranted in view of the fact that the agglutination test is positive after the first week of the disease. Cooking of infected rabbits is all that is necessary to make them safe to eat, but the danger of infection while dressing them still remains. A very small abrasion acts as a site for infection. The deer fly becomes infected from biting sick rabbits and infects human beings secondarily. This fly is not infectious for longer than two weeks in most instances. The wood tick is not only infected himself, but infects his offspring and the organism may be carried through several generations. There is no question about the specific nature of the agglutination test for tularemia.

ACANTHOSIS NIGRICANS

ADULT AND JUVENILE TYPES *

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AND

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PHILADELPHIA

Acanthosis nigricans is a disease that is full of absorbing interest. It resembles a number of skin diseases; yet it retains its individuality, which enables the observer to ferret out its peculiarities amid a maze of symptoms due to other causes. It has been the subject of many papers, and a great deal has been written about its various aspects. It is our intention to deal at this time with one of the essential questions connected with the etiology of this condition, namely, the relationship of neoplastic tumors of the abdomen and pelvis to the malignant type of acanthosis nigricans and the relationship of congenital malformations, adhesions and benign tumors in the abdominal cavity in the class of patients with acanthosis nigricans described as the juvenile type.

The circumstances under which the mechaniconervous theory of Darier has arisen are of interest. In 1892, Darier [1] reported two cases of acanthosis nigricans under his observation. The outstanding circumstance, to his mind, was the presence of abdominal cancer in each case. In the first case, the cancer was demonstrated on postmortem examination and in the second, the clinical evidence showed beyond any doubt of preadventure that the patient had an abdominal neoplasm. The incident led Darier [2] to advance the mechaniconervous theory. He assumed that the intra-abdominal pressure exerted by malignant tumors or the toxic products attending malignant disease cause abnormal physiologic function of the abdominal sympathetic system, particularly of the splanchnic nerves. Pollitzer,[3] who was the first to describe the disease graphically, subscribed to the view that a visceral malignant condition of the abdomen is the causative factor. However, the hypothesis of Darier does not equally apply to all patients having the clinical aspects that are characteristic of acanthosis nigricans: There are

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* From the Department of Dermatology, Jefferson Medical College and Lankenau Hospital.

1. Darier: Ann. de dermat. et syph., 1893.
2. Darier: Ann. de dermat. et syph., 1895, p. 97.
3. Pollitzer: International Atlas of Rare Skin Diseases, 1890.

patients whose ages vary between childhood and old age, and in whom cancer has not been demonstrated by painstaking physical examination, laboratory investigations or by the course of the disease itself. Referring to this type of patient, Pollitzer [4] advanced the possibility that fibrous bands, congenital malformations, benign tumors or adhesions may interfere with the normal function of the abdominal sympathetic system, differing only in the extent of the condition in adults.

Each of these conceptions has some foundation of fact, but it is difficult to conceive that mere localized intra-abdominal pressure, the result of the presence of neoplasms or some other mechanical interference or toxic products, leads to acanthosis nigricans. If these were the only causes it would occur more often than it does, and one would not expect the symmetrical pigmentation and papillomatosis which are the major distinguishing characteristics of the disease. Furthermore, instances of the syndrome being associated with a malignant condition elsewhere [5] than in the abdomen, exposure to heat [6] or cold,[7] syphilis,[8] decapsulation of the kidneys [9] and hepatic cirrhosis [7] are on record.

We are thus led to consider whether the hypothesis suggested by Porias [10] would not be more acceptable than the theories propounded by Darier and Pollitzer. Porias assumed that the dystrophies of the skin are dependent on altered secretion of certain internal glands on the action of which the normal condition of the skin is dependent. Debilitating conditions are the active causes, among which he stated that cancer is the most common one. His explanation may be more significant than it appears to be on the surface.

The earliest and best known syndrome which is associated with widespread pigmentation and which is dependent on the derangement of internal secretion in consequence of some toxic or destructive lesion of a ductless gland is Addison's disease. In consideration of the pathogenesis of this disease, it has been pointed out by numerous investigators that the suprarenal system is consistently the seat of morbid changes. These changes may be brought about by simple atrophy of the suprarenal gland. With atrophy or cirrhosis, a thickening or obliteration of the blood vessels occurs. Sometimes the sclerosis exists on a syphilitic basis.[11] Tuberculosis is a common cause. Among other conditions which are at times responsible may be mentioned tumors invading

4. Pollitzer, S.: Acanthosis Nigricans, J. A. M. A. **53**:1369 (Oct. 23) 1909.
5. Petrini de Galatz: Annales, 1914, p. 321.
6. Janovsky: International Atlas of Rare Skin Diseases, 1890.
7. Crocker: Diseases of the Skin, 1908, vol. 2, p. 597.
8. Juan de Azuria: J. Cutan. Dis. **31**:966, 1913.
9. Wise: J. Cutan. Dis. **36**:35, 1918.
10. Porias: Wein. klin. Rundschau. **38**:671, 1913.
11. Esser: München. med. Wchnschr., 1908, vol. 55.

the suprarenal gland, thrombosis of the suprarenal veins and blood extravasation into the suprarenal bodies. Necrosis, hemorrhages and edema of the suprarenals are often found after the glands become affected, especially in severely infectious diseases and intoxications.[12] Diphtheria toxin has an especial affinity for these glands. According to Roux and Yersin,[13] after an injection of diphtheria toxin in animals, the suprarenals are always found markedly hyperemic and suffused.

Medicine is preeminently a science of contrasts. There are cases of Addison's disease in which the suprarenals are normal.[14] On the other hand, there are cases in which clinical signs of Addison's disease are not present, but in which autopsy shows destruction of both suprarenals.[15] This seeming paradox is made to stand out in bold relief from time to time by postmortem examinations and is illustrated by a coincidence that occurred recently.

T. D., white, aged 60, was admitted to the nervous ward of the Philadelphia General Hospital on Oct. 8, 1926. The patient had shown none of the symptoms of Addison's disease; yet the postmortem examination showed a definite pathologic change in the suprarenals. The left suprarenal gland was larger than normal and adherent to the surrounding fat. The medulla and cortex were poorly differentiated. Focal areas of hemorrhage were present in the medulla. The medullary portion of the right suprarenal gland was entirely replaced by a blood clot which was surrounded by a thin rim of cortex.

There is little question but that the suprarenals are vital factors, but we do not share the view that disease or functional disturbance of the suprarenal glands or the suprarenal system in itself is responsible for acanthosis nigricans. This is made obvious and manifest by the animal experimentations of Oppenheim and Loper,[12] and by the clinical course of many of the cases to which we will have occasion to refer later. In their desire to solve the problem of the slow and complete suppression of the suprarenal function, Oppenheim and Loper injected into the capsule a susceptible poison to cause a progressive destruction of the parenchyma of the gland without causing a general reaction. They obtained experimentally the slow suprarenal insufficiency of which the symptoms are absolutely identical with those of epinephrine insufficiency in man, but they never observed pigmentation.

Nixon's [16] patient presented a classic of acanthosis nigricans. She complained of considerable discomfort from the papilloma of the eyelids. Otherwise, there was no evidence of any visceral disease such as

12. Oppenheim and Loper: Compt. med. soc. de biol., 1903.
13. Roux and Yersin, quoted by Flata: Endocrine Diseases, ed. 3, p. 354.
14. Lewin: Charité ann., 1892.
15. Neusser: Ann. Halder, 1910.
16. Nixon: Proc. Roy. Soc. Med. **7**:108, 1914.

has been described in other cases. The patient was aware of an increasing lassitude and occasional feelings of faintness which suggested a resemblance to the early symptoms of Addison's disease.

Flaskamp's [17] patient was a well developed woman, aged 23. She was referred to the clinic with the diagnosis of Addison's disease. The physical symptoms were normal except for those revealed by the vaginal examination. There was a palpable mass, which was diagnosed as carcinoma of the right ovary. On laparotomy it was found that the patient's ovaries, fallopian tubes, uterus, pyloric end of the stomach, large omentum and the abdominal lymph glands were all involved in a carcinomatous growth.

Of singular interest was the condition found at postmortem. The right suprarenal gland was definitely enlarged and thickened. The medulla was almost entirely replaced by pale yellow masses which traversed not only the medulla but the cortex as well. However, the cortex itself was free from primary tumors. The state of the left suprarenal was the same as that found on the right side. Both organs were poor in pigment. The lymph nodes near the celiac plexus were enlarged and were permeated with small white glistening masses. The pancreas was embedded in a mass of small lymph nodes, and fatty tissue replaced the glandular tissue of the tail of the pancreas. The pyloric end of the stomach was the seat of a large, malignant tumor. There was no evidence of metastasis of the chest.

In sharp contrast to the foregoing case are the revelations found at postmortem in Klotz and Rodenberg's [18] patient. The large intestine, commencing at the splenic flexure and extending down to the beginning of the rectum, was the seat of a small spindle-cell sarcoma. Evidence of metastasis of the liver, kidneys and mediastinal glands was present, but the suprarenals were normal.

The chief points of interest in Wise's [9] case were that the patient was of the emotional type, tired easily and complained of lassitude. There was no evidence of tuberculosis or syphilis. In a fit of despondency, she swallowed some mercuric chloride but made an uneventful recovery. She had her kidneys decapsulated on the advice of a physician. A year after the decapsulation, she suffered from a generalized dermatosis attended by extreme itching. Several weeks later, following the acute dermatosis, the skin of the patient began to assume a brownish-yellow tint, and at the time she was examined for the latter complaint, it was found that she had acanthosis nigricans. In connection with the patient's complaint of tiring easily and lassitude, the question of hypofunction of the suprarenal glands comes to mind. The possibility that in the process of decapsulation of the kidneys the part of the chromaffin tissue which lies in the hilum of the kidneys may have been injured, thus either initiating the dermatosis or hurrying its development, must be given consideration.

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17. Flaskamp: Deutsche med. Wchnschr. **50**:1180, 1923.
18. Klotz and Rodenberg: J. Cutan. Dis. **31**:306, 1913.

Under the influence of antisyphilitic treatment, Jaun de Azuria's [8] patient improved to the extent that he lost his cachectic appearance. The author, however, does not state whether the pigmentation and the papillomatosis shared in the improvement.

In Wieder's [19] patient, the condition was of the juvenile type. There was impairment of the secretions of the ductless glands, particularly of the suprarenal glands. The increased sugar tolerance and the prolonged action of the epinephrine are in favor of the assumption.

The diversity of the factors that may be found associated with acanthosis nigricans is further emphasized by the observations of Miescher: [20] his patients, a brother and sister, had diabetes mellitus associated with acanthosis nigricans.

REVIEW OF THE LITERATURE

In the thirty-seven years since 1890, when Pollitzer and Janowsky simultaneously published their case reports, 116 cases showing this remarkable cutaneous condition have been described in medical literature. We do not begin to presume that all the cases have been recorded. On the contrary, as pointed out by Pollitzer, the condition is more frequently met than the published reports would indicate.

In the discussion in connection with the relation of malignant disease to acanthosis nigricans, Pollitzer,[4] in 1909, reviewed the histories and the course of the disease in fifty-two cases. There were seventeen patients in the group below the age of 20 years. Of the remaining thirty-five patients, including Spietschka's patient, aged 18, who had a deciduoma of the uterus, fourteen suffered from neoplasm of the gastrointestinal tract; in five there was a malignant condition of the uterus; in three, the breast was the seat of the malignant disease. The remaining thirteen cases of the thirty-five, although classed among the malignant type, were in all respects normal from the standpoint of neoplastic disease.

In Frick's [21] series of twenty-two patients, including the case reported by him, it was found that contrary to the common conception the neoplastic factor was absent in twelve of the patients of a group of twenty whose ages ranged from 20 to 76.

Eleven cases, in which acanthosis nigricans was diagnosed, were reported in the Japanese literature. Reports of six of the cases, one of which was studied and reported by Toyama,[22] were compiled by him.

19. Wieder: Acanthosis Nigricans, Juvenile Type, J. A. M. A. **87**:1964 (Dec. 11) 1926.

20. Miescher: Dermat. Ztschr. **32**:276, 1921.

21. Frick: New York M. J. **102**:232, 1915. In this series, Pribianis case 1 was omitted. It was included in Pollitzer's study.

22. Toyoma: Dermat. Ztschr., 1913, vol. 20.

Sekiba [23] was able to add reports of five more cases at a later date. Only one of the eleven cases was of the juvenile type; of the remaining cases, nine were in adults and one was in a child of 9 years.

In perusing the literature in connection with our two cases that are reported herein, we have found thirty-one references apart from the cases studied by Pollitzer, Frick, Toyama and Sekiba in the American, English, German, French, Russian and Dutch literature. From the study of the literature pertaining to these cases, it is again made obvious that it does not follow that in adult patients the dermatosis is always associated with malignant disease. This group was composed of one patient aged 3 years; three whose ages are between 11 and 20; eight between 21 and 30; five between 31 and 40; two between 41 and 50; six between 51 and 60, and two between 61 and 70 years. In five of the patients, either the age or the course or both could not be determined.[24] In the patients between 20 and 30 years, there were two in whom the course was malignant and five in whom it was benign; between the ages of 31 and 40 years, there were two in whom the course was malignant and three in whom it was benign. In patients between the ages of 41 and 50, there were two in whom the course was malignant; between the ages of 51 and 60, there were three patients in whom the course was malignant and two in whom it was benign. In the group between 61 and 70, there were only two patients, and in them the course was benign.

COMMENT

When one considers the stress that is laid on the relation of malignant disease to acanthosis nigricans, the conviction cannot be escaped that all efforts, except for a limited number of studies of late, have been directed in the past toward establishing the fact that the papillopigmentary dystrophy under discussion exclusively depends on a lesion or functional disturbance of the abdominal sympathetic system which is affected by cancer or its products. The analysis of the patients as to their ages and the course of their disease shows that, under the accepted classification, a considerable number of these patients who belong to the malignant type are certainly free from all evidence of malignant disease. This was established in some of the patients on a clinical basis, while in others the fact was determined at postmortem. It is our impression, therefore, that the assumption that the adult type of acanthosis nigricans is dependent on malignant disease is not warranted. At the same time, we have no desire to convey the impression that whenever one is confronted with a neoplastic situation, one is to consider it purely accidental or purely extraneous.

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23. Sekiba, quoted by Flaskamp: Ztschr. f. Krebsforsch. **21**:369, 1923.
24. The original papers were not available for purposes of reference.

REPORT OF CASES

CASE 1.[25]—*History.*—A taxi driver, aged about 58, who was short of stature, unmarried, and who had been born in France, casually observed in the winter of 1923, that the skin of his fingers was fissured and that it itched. He was disposed to attribute this condition to the cold weather and his occupation. Later, the more or less widespread pigmentation and itching attracted his attention, and he sought relief at the clinic. There was nothing of importance in the family or past histories. He had had the usual diseases of childhood but could not recall their true nature. He was a moderate drinker of wine and smoked a pipe, cigarettes and cigars, but not to excess. The patient was constipated, and to relieve the constipation he had, for a number of years, taken two "Nature Remedy"[26] pills daily.

Physical Examination.—The patient was well developed and well nourished. His scalp was freely movable; the hair was sparse, dry and lusterless. The pupils were regular, equal and responded to light and in accommodation. On gross examination there appeared not to be paralysis of the cranial nerves. The mucous membrane of the mouth was slate colored, and a number of warty excrescences were present in line with the upper and lower teeth. The tongue protruded in a straight line without tremor. The lungs and heart were normal; this was confirmed later by x-ray and fluoroscopic examinations. The abdomen was not tender; it was relaxed and free from tumors on palpation; the reflexes were intact. The upper and lower extremities were normal.

The skin of the entire cutaneous surface was rough, thickened and pigmented. The natural folds and lines were exaggerated. The cutaneous pigmentation differed from slate gray to black. It was found on the face, neck, axillae, adjacent areas of the mammary glands, about the larger joints, the umbilicus, the groins and the anogenital region. The outstanding feature of discoloration was the fact that it was symmetrical. Along with the pigmentation, the patient also presented papillary hypertrophy. In the distribution, size and appearance the papillomatosis also varied. In the region in which the pigmentation was most pronounced, for example in the axillae or groins, the papillary hypertrophy was most marked. Many of the papillomas were villous, velvety and pedunculated. Others possessed the conformation of verucca-like excrescences. Still others resembled the juvenile type of warts. In addition there were many ill-defined and fully developed papillomas scattered over the face and body.

During the two years following the patient's admission to the clinic, the only observation of note was the appearance of evanescent edematous areas from time to time. The areas varied in size from that of a silver dollar to that of the palm of a hand, and would appear where the pigmentation was slight in comparison. Superimposed on the edematous area were thick walled vesicles the size of a pea or a nodule. When the edema and vesicles disappeared, the involved area was left more pigmented than at the beginning. In the course of time, papular papillomas and hypertrophy, which were ill defined at first but later were more mature, made their appearance.

The patient's blood pressure was 118, systolic; 86, diastolic. The composite blood picture revealed a mild grade of secondary anemia. The urine was free

25. The patient was presented before the American Dermatological Association, abstr., Arch. Dermat. & Syph. **14**:618 (Nov.) 1926.

26. Chemical Analysis: Aloin, cascara, belladonna root, podophyllin, burdock, juniper berries, sarsaparilla, mandrake and rhubarb. "Nature Remedy," Nostrums and Quackery, Chicago, American Medical Association Press, 1921, p. 532, vol. 2.

from chemical and microscopic abnormalities. Repeated examinations of the urine for melanin and urine chloride gave negative results. The Wassermann reaction of the blood was also negative.

Histologic Examination.—Sections for histologic studies were prepared. The biopsy specimens were obtained from the axillae and the posterior aspect of the chest. Much discussion of the microscopic lesions is unprofitable, as we do not have any new facts to add. The descriptions of the histologic lesions from the beginning have referred, depending on the duration of the disease and the section of the skin from which the biopsy specimens are made, to widening or thickening of

Fig. 1.—Appearance of patient with acanthosis nigricans, adult type, showing axillary and periumbilical pathologic changes. From the Jefferson Medical College.

the stratum corneum and the granular layer, the hypertrophy of the prickle cells and the increase of pigment in the basal layer. The changes described have nothing in them peculiar to acanthosis nigricans.

A biopsy specimen was taken from the palm of the hand and prepared according to the technic of Osborn for the purpose of studying the presence of arsenic in the skin. The object was to eliminate the possibility of the dermatosis being caused by arsenic. In the sections studied, there was nothing that corresponded to the arsenic seen in the sections by Osborn.

Chemistry of the Blood.—In addition to the routine analysis of the blood for nonprotein nitrogen, urea nitrogen, creatinine, uric acid and sugar, the

following tests were applied to the study of the blood: calcium, carbon dioxide combining power, cholesterol, phosphorus, blood chlorides and the van den Bergh. In subjecting the patient to these tests, we did not set out to prove some preconceived hypothesis of our own. Our attitude relative to this part of the investigation was the same that an internest assumes when making a routine physical examination.

Roentgen-ray and fluroscopic examination of the gastro-intestinal tract and chest did not reveal pathologic changes. At a later date, the roentgen-ray and fluroscopic examinations were repeated but again with negative results. Also, the roentgenogram of the pituitary gland was negative.

Basal metabolic studies were not made on this patient. The reaction to epinephrine was not definite. However, when we took into consideration the low blood pressure of our patient it was suggestive of hypofunction of the suprarenals.

CASE 2.[27]—*History.*—Viola C., aged 13, American born, was admitted to the Lankenau Hospital, Philadelphia, on March 13, 1928, with the complaints of localized thickenings of the skin associated with increased pigmentation.

We first studied this patient at the Methodist Hospital from Jan. 12, 1926, to Feb. 12, 1926, and the contrasting symptoms as well as the intervening history shall be noted.

The family history did not reveal carcinoma in any of her forbears. One sister had pulmonary tuberculosis at the time we saw the patient and was in a tuberculosis sanatorium. Two brothers and one sister were well, and as far as could be determined other cases of tuberculosis were not present in this family or its antecedents. Measles and mumps were the only diseases of childhood noted. Menstruation had never occurred.

The disease had its onset eight years before presentation, at which time the patient's parents had noticed a black discoloration of the skin in the region of the forehead, around the mouth and over the back of the neck. The parents dated the onset from the time of an accident in which she was supposed to have applied an oily preparation to her face and neck and to have gone out in the sun to play (the oily preparation consisted of an old motor oil and gasoline). Following this exposure to the sun, the patient had developed a severe and prolonged sunburn, and her skin had not been normal since this date. The mother insisted that prior to this time the patient's skin had been fair and white.

About three weeks after the exposure to the sun, the mother said that "she seemed very tired and did not have her former life." Since this time, the pigmentation had spread over the entire torso, with the thickening of the skin in the axilla and neck.

Subjective symptoms were not present.

Appendectomy was performed in July, 1927, and tonsillectomy in October, 1927.

Physical Examination.—The blood pressure on admission was 116, systolic; 64, diastolic; two years prior to this it was 100 systolic; 60, diastolic.

The skin of the face was dark and shaded into a darker thickened area over the chin and the lower lip. The circumoral skin was thickened, furrowed and finely segmented. Tonsillar culture made on Feb. 1, 1926, showed the presence of *Streptococcus hemolyticus* and *Staphylococcus aureus.* Culture from the tonsillar crypts showed many *Streptococcus hemolyticus* and *viridans* and *Staphy-*

27. This patient was presented before the American Dermatological Association (footnote 26, p. 619).

lococcus aureus. The tonsils, however, had never occasioned any frank attacks of tonsillitis. They were, however, removed in October, 1927.

The arms were not greatly involved, although the skin was lightly pigmented and furrowed. The antecubital regions showed the most marked change on the arm. Over the chest, abdomen and back the same condition existed; the skin of the abdomen showed more marked involvement than other portions of the torso.

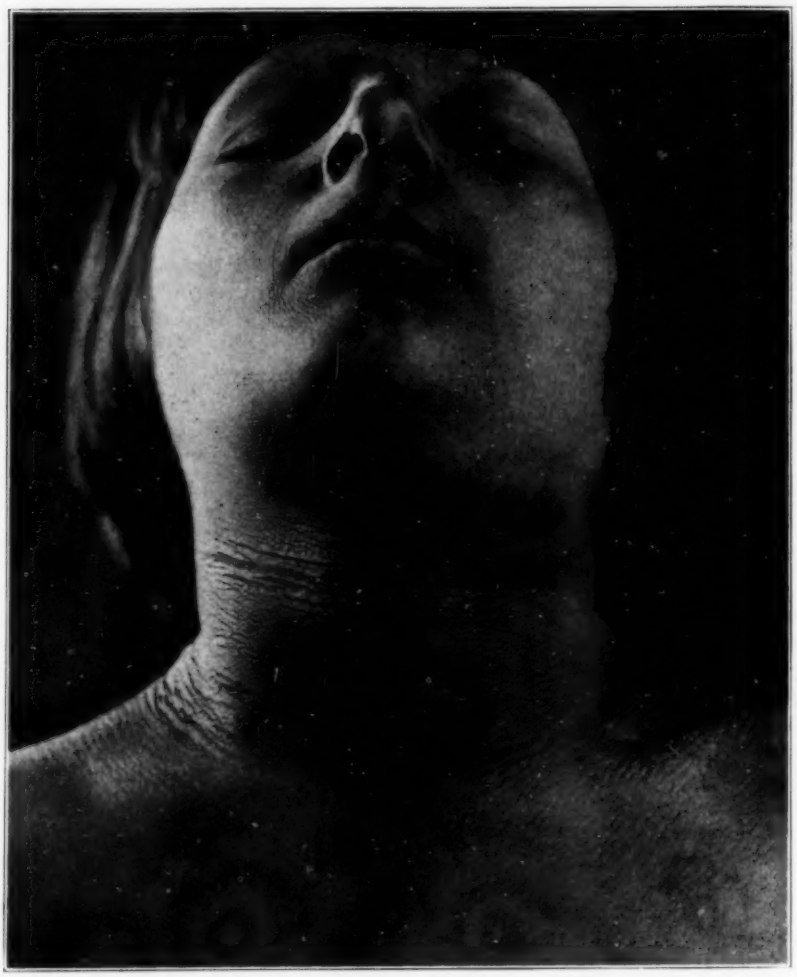

Fig. 2.—Acanthosis nigricans, juvenile type, showing involvement of anterior surface of neck. From the Lankenau Hospital.

At the site of the appendectomy, there was a white line quite in contrast to the black surrounding skin. The groins, perianal and perivaginal areas were deeply pigmented and the skin thickened. The extremities were less pigmented and showed the greatest pigmentation and thickening in he popliteal spaces.

Resonance was generally present. The breath sounds were clearly heard, but at the left apex the breath sounds were bronchovesicular in type and at the right

apex the sounds were harsher than normal with a prolongation of the expiratory phase. Râles were not elicited at any point in the chest. The heart was normal.

Areas of tenderness and tumor masses were not present in the abdomen. The liver was normal in size, and the spleen was not palpable. Examination of the abdomen made at the Methodist Hospital on Feb. 1, 1926 revealed tenderness over the appendical region and over the splenic area. The spleen was markedly palpable.

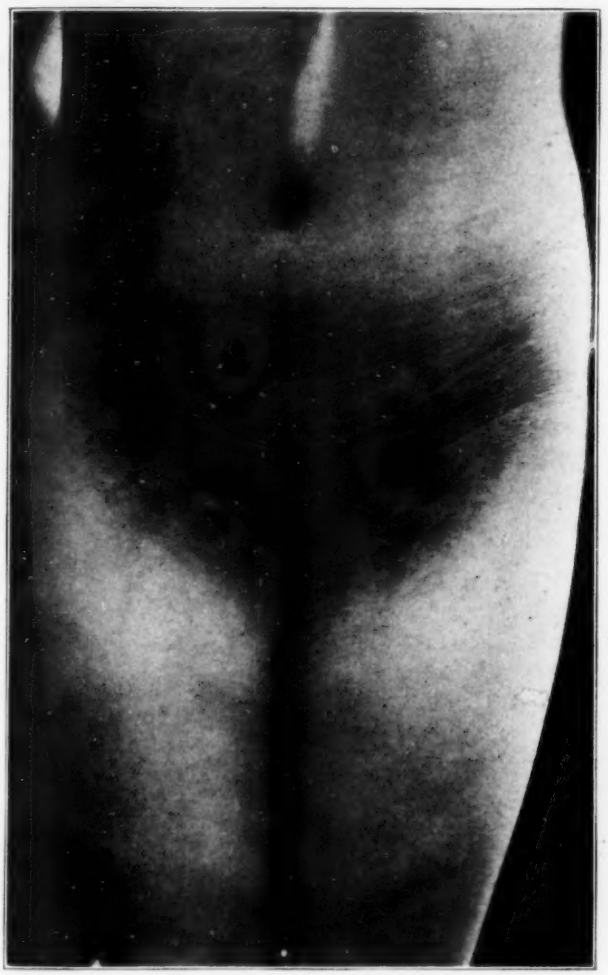

Fig. 3.—Acanthosis nigricans, juvenile type, showing increased pigmentation about umbilicus and genitalia. From the Lankenau Hospital.

Appendectomy was performed by Dr. John B. Deaver, July 3, 1927. The appendix was found to be retrocecal; the mesenteric glands were enlarged, and the free fluid was present in the peritoneal cavity. The pathologic report showed that the appendix had been of the chronic interstitial type.

Neurologic examination gave negative results as did the report in 1926.

Pirquet tests were made on two occasions, and showed a reaction to tuberculin on each occasion.

The Wassermann and Kahn reactions were negative.

On March 19, 1928, the blood urea was 15 mg. and the blood sugar, 90.

On Jan. 21, 1926, the blood urea was 14 mg. and the blood sugar, 100.

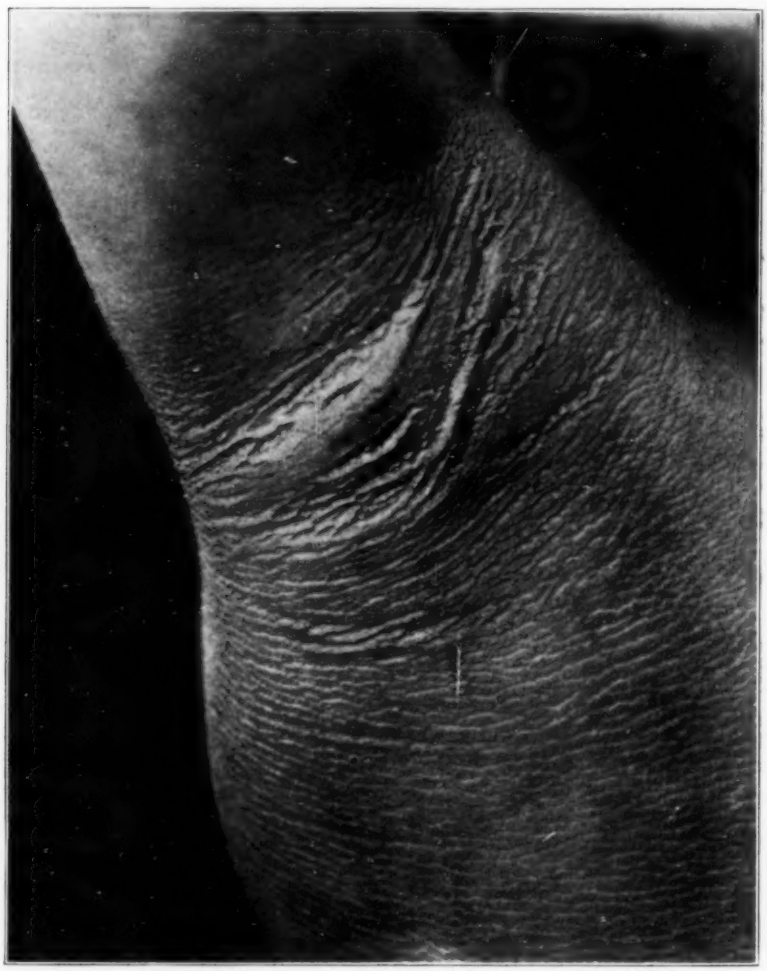

Fig. 4.—Acanthosis nigricans, juvenile type, showing axillary involvement. From the Lankenau Hospital.

On Jan. 21, 1926, excretion of phenolsulphonphthalein in the first specimen of urine (230 cc.) was 50 per cent and from the second specimen (75 cc.), 20 per cent.

On March 14, 1928, the first specimen showed 65 per cent and the second specimen, 20 per cent.

On March 3, 1928, the creatinine was 1.2 mg. per hundred cubic centimeters of blood. The coagulation time was eight minutes.

On April 4, 1928, the free phenols of the blood were 1.56 mg. per hundred cubic centimeters.[28] On the same date, there were 13.5 mg. of calcium per hundred cubic centimeters of blood serum.

On March 24, neither ova nor parasites were found in the stool.

On March 13, 1928, the blood count showed: hemoglobin, 80; red cells, 4,440,000; white cells, 10,600; neutrophils, 69; lymphocytes, 23; large mononuclears, 8. On Feb. 1, 1926, the blood count showed: hemoglobin, 85; red cells, 4,321,000; white cells, 6,200; neutrophils, 58; lymphocytes, 40; large mononuclears, 2.

On March 15, 1928, the basal metabolism was normal; on Jan. 5, 1926, it was 15 per cent subnormal, and the pulse rate was 76 per minute.

On March 19, 1928, the basal metabolism was normal.

The results of the sugar tolerance test are shown in table 1.

TABLE 1.—*Results of Sugar Tolerance Test*

	Blood sugar	Urine
1st hour before test	80 Gm. per 100 cc. blood	0
1st hour after test	90 Gm. 1st hour	0
2nd hour after test	95 Gm. 2nd hour	0
3rd hour after test	80 Gm. 3rd hour	0

X-Ray Examination.—On March 14, examination of the chest showed marked infiltration of the hilum present on both sides with a heavy bilateral cottony peribronchial thickening with extension of the trunks to the periphery.

On March 16, 1928, examination showed the sella turcica to be normal in size, without evidence of erosion.

Examination of the gastro-intestinal tract did not show any characteristic filling defect of the stomach or duodenum. The stomach was normal in tone, position and peristalsis. Examination twenty-four hours after a barium meal did not reveal any pathologic condition of the gastro-intestinal tract. In 1926, the x-ray picture had revealed ptosis of the transverse colon.

Evidence of thymic enlargement was not present.

The results of the Goetsch test are shown in table 2.

TABLE 2.—*Results of the Goetsch Test*

Blood Pressure Before the Administration of Epinephrine		Pulse Before the Administration of Epinephrine
124/64		90
120/60	5 minutes later	90
124/66	10 minutes later	86
122/72	15 minutes later	92
126/70	20 minutes later	98
122/66	30 minutes later	90
128/70	45 minutes later	92
116/58	1 hour later	94
122/62	1½ hours later	90
124/64	2 hours later	90

The characteristics of the full meal were: quantity, 12 cc.; color, natural; odor, 0; reaction, neutral; consistency, mucoid; bile, 0; occult blood, very faint;

28. The method employed was that of Benedict, Stanley: J. Biol. Chem. **61**:67 (Aug.) 1924.

benzene, trace; guaiac, 0; free hydrochloric acid, 0; total acidity, 12; mucus; some white blood cells; some epithelial cells; some granular material.

Melanin was not found in the urine in 1926, nor was it found in 1928.

The urine was normal.

The morning temperature ranged from 97 to 97.4 F.; the evening temperature ranged from 98.2 to 99.2. The same variation of temperature was present during 1926. The pulse rate varied from 60 to 110 a minute.

The weight on admission was 80 pounds (36.3 Kg.). The weight five weeks after admission was 94 pounds (42.6 Kg.).

Examination of the Skin.—A section of the skin from the axilla was studied by Dr. Fred Weidman, who made the following report:

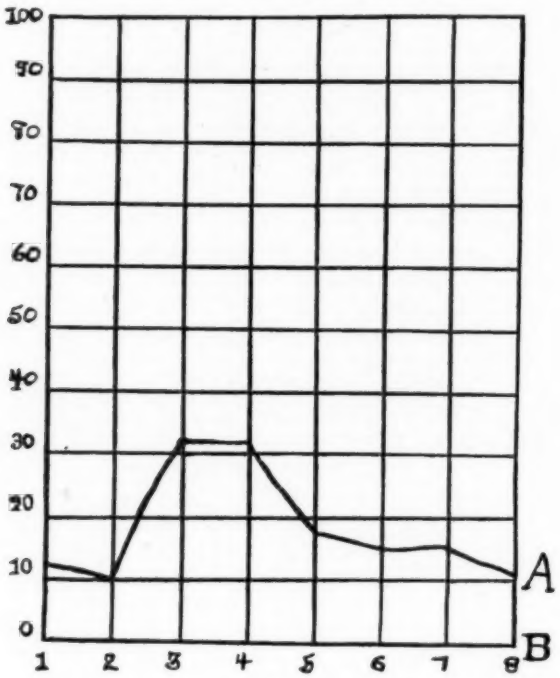

Fig. 5.—Fractional test meal. *A* indicates the total acidity and *B*, free hydrochloric acid.

The section consisted of collagen stroma which contained a few normal appearing sweat glands and from which numerous more or less branching, finger-like extensions passed outward and upward; the latter were clothed by a comparatively normal appearing epiderm. The uppermost parts of the connective tissue stroma were delicately fibrillar after the fashion of the pars papillaris. Moderate numbers of capillaries passed perpendicularly through these parts toward the surface. These perpendicular extensions frequently sent out lateral branchings which in turn were supplied by capillaries, and the presence of these more or less arborescent extensions of the corium was responsible for the finely mossy appearance of the skin as viewed clinically.

The Epiderm: At first sight, the epiderm appeared to be most unusual, but after a little analysis it was recognized that its irregular and bizarre appearance

was really referable to the course it had to take as it clothed the connective tissue extensions of the corium. The various layers of the epiderm were clearly defined: thus, the stratum corneum consisted of a thin layer of keratinous material, and the stratum granulosum was narrow and appeared quite normal. At the utmost summits of the cutaneous villi, the prickle cell layer consisted of only four or five layers, and, with the rete, appeared normal.

In the deeper recesses, between the villi, the prickle cell layer was thickened; there might have been ten or a dozen layers. Dr. Weidman did not believe that the epidermal thickening was extreme in any place; variations in the obliquity of the plane of section could account for the larger appearing masses of epithelial cells.

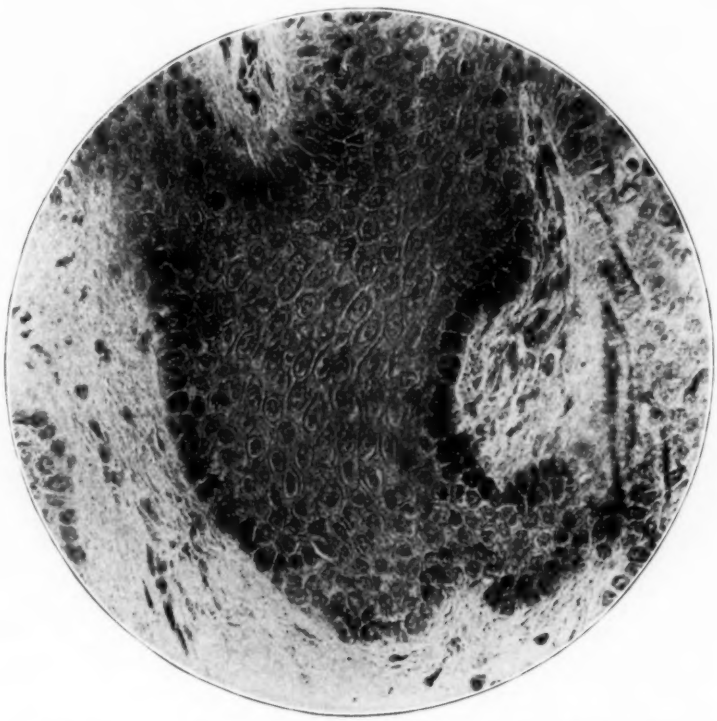

Fig. 6.—Section of skin from lateral surface of neck, showing hyperplastic character of epidermal cells.

The amount of pigmentation in the rete was variable. In some places the cells were loaded and the pigmentation was scanty, but on the whole it was hard to understand how the skin could be so deeply pigmented clinically and yet exhibit so little microscopically. Mitotic figures were not seen. Rete cells appeared mostly as one layer of cuboidal or at most slightly columnar cells.

Summary: The surface of the skin was thrown into fine villosities, which at first sight seemed to be the result of a hyperplasia of the tissue of the pars papillaris. But this explanation was not quite satisfactory, because cellular hyperplasia such as should be expected if the foregoing explanation were true was not recognizable there. Dr. Weidman was prejudiced against the idea that the epiderm was the hyperplastic moiety, largely because there were not any

important increases in the thickness of the epiderm nor any irregularities in the way of exaggerated interpapillary pegs. It is thus difficult to come to an opinion as to whether the corium or epiderm were primarily concerned and were responsible for the villous qualities. All things considered, the preponderance of evidence was in favor of the epiderm. It must be added at once, however, that the epiderm was in many places preserved with surprisingly uniform thickness. It is also to be remarked that the amount of pigmentation viewed microscopically was not commensurate with that seen clinically. It is easy to understand why the lesion was so soft and velvety clinically, for keratosis was not associated with the changes in the epiderm, hyperplastic as they were. Chromatophores were few and far between; when they did occur, they were not present in aggregations.

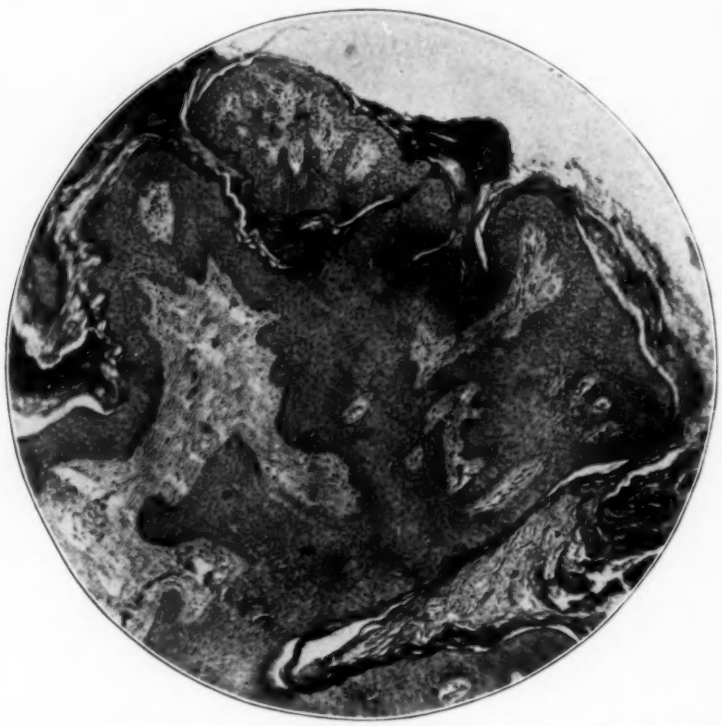

Fig. 7.—Section of skin from neck, showing accompanying expansion of the subpapillary fibrous tissue.

The rationale appeared to be as follows: The epidermal cells became hyperplastic to the extent that they required more room for expansion. As they thus pressed laterally (parallel to the basement membrane), the skin surface became thrown up into folds and subfolds. This accounted for the villous characters. At the same time, there was an accompanying expansion of the subpapillary fibrous tissue in connection with which it assumed a loose, finely fibrillar appearance.

Comment.—Excepting for symptoms suggestive of tuberculosis, all other observations in this case were approximately normal.

Treatment consisted of fresh suprarenal cortex given immediately after meals and bone marrow given before meals.

CONCLUSIONS

The fact that the symptoms here described followed exposure to the sun is probably incidental; however, we recall the case described by Darier in which acanthosis nigricans followed a severe sunburn in a girl aged 9 years. Meirowsky [29] was able to prove that normal human skin can be made to form melanotic pigment in comparatively large quantities if the skin is subjected to a high temperature in a moist chamber and therefore maintained that the formation of pigment is possible in the cells of the epidermis.

We are, however, of the belief that this juvenile type of acanthosis nigricans is of tuberculous causation (probably a retroperitoneal extension to the suprarenal cortex by way of the lymphatics or invasion through the blood stream).

We do not consider it within the province of this paper to enter into the discussion of the embryology and anatomy of the chromaffine system nor into the much discussed and little known mechanism of pigment production; however, what Falta said of the relation of the suprarenal system to Addison's disease might equally well apply to acanthosis nigricans:

> Whether the complete or partial destruction of the suprarenals will, in a given case, lead to Addison's disease depends upon whether the portion of the suprarenal apparatus (chromaffin cells) lying outside the glands proper is sufficiently well developed to assume the function of the destroyed tissue, or whether the destruction has progressed slowly enough to give time for vicarious hypertrophy.

The question of acanthosis nigricans involves many assumptions and complications, and no single premise carries with it finality.

According to Spietschkas, the removal of a uterine carcinoma brought about the complete retrogression of the symptoms of acanthosis nigricans; yet we do not subscribe to the belief that neoplasms, adhesions or mechanical interferences per se are causative. We would rather believe that excitation of toxemia generated by such diseases as carcinoma, tuberculosis or syphilis, or that sunlight acting on the enzymes (according to Bloch) in the skin must be considered the causal factor.

ABSTRACT OF DISCUSSION

DR. SIGMUND POLLITZER: There is a certain value in hypotheses that are submitted in connection with newly discovered conditions. They attract attention in a certain way, and the hypothesis is either proved or disproved, and then new fields of investigation may be opened. It was a fair assumption when in the first half dozen cases of acanthosis nigricans cancer was found in the abdomen that this growth bore a close etiologic relationship to the condition. On the

29. Meirowsky: Straphlentherapie, vol. 2, no. 1; Dermat. Ztschr. **24**:705, 1917.

other hand, the fact that in the last forty years there have been possibly 500 cases, all together (counting 4 cases not recorded, to 1 of the 125 reported), and that the number of cases of cancer seen in these years runs into many millions makes it reasonable to suppose that cancer is not directly the cause of the condition. As Dr. Knowles said, one wants facts, and most of all one wants postmortem examinations. One does not want to speculate but to know what is present in every case, particularly in the mysterious juvenile cases in which the condition is progressive for a short time and then remains stationary throughout life.

What I wish particularly to emphasize is that the physician who does not perform a postmortem examination on a patient with acanthosis nigricans in the present state of our knowledge is guilty of a sin of omission.

DR. KNOWLES: I only wish to say that postmortem examinations have not been obtained on the present cases, because the patients are still alive.

TINEA OF THE SCALP

TREATMENT WITH THALLIUM SALTS *

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It is well known that the treatment for tinea of the scalp was a problem without satisfactory solution until the application of roentgentherapy. No known fungicidal agent can reach the depth of the hair follicle or the interior of the hair itself in order to destroy the causative fungus. Therefore, any therapeutic measures must be directed toward the temporary removal of the diseased hair. Hence, x-rays are used in view of the epilating action of this physical agent in certain doses.

The discovery of the epilating action of thallium salts was observed and classified as a sign of thallium poisoning by several investigators. In the last few years, this epilating action of thallium has been used in the production of a temporary alopecia in tinea of the scalp.

REVIEW OF THE LITERATURE

Sabouraud [1] was the first to report a case of defluvium capillorum under the accidental use of a thallium salt by mouth, and also was the first to perform experiments in regard to the usefulness of this drug in the treatment for tinea of the scalp. Sabouraud's experiments with thallium in ointment form were far from satisfactory, and he soon gave them up after observing some alarming toxic phenomena in his patients.

Ricardo E. Cicero [2] of Mexico City used thallium in the treatment for tinea of the scalp in children in the Dr. Balmis school as far back as 1909, and in 1918 he presented before the Mexican Academy of Sciences his favorable report based on the treatment in 459 cases. In 1922, Cicero [3] reported his further experience with thallium at the Sixth Inter-

* Submitted for publication, July 18, 1928.

* Read before the Fifty-First Annual Meeting of the American Dermatological Association, Washington, D. C., May 1, 1928.

1. Sabouraud: Entretiens dermatologiques, Paris, O. Doin et fils, 1913, p. 432.

2. Cicero, Ricardo E.: Revi Med. de puebla **1**:177 (March 15) 1919.

3. Cicero, Ricardo E.: Proceedings of the Sixth International Latin-American Congress of Medicine, Cron. méd.-quir. de la Habana **49**:258 (July-Dec.) 1923.

national Latin-American Congress of Medicine held at Havana, based on a total of 501 patients treated and cured by this procedure. The number of children treated by Dr. Cicero to the present time mounts well into the thousands.[4]

Another Mexican dermatologist, Dr. J. Gonzalez Urueña,[5] treated a total of 400 patients with tinea of the scalp with thallium and obtained a definite cure in 95 per cent of his cases.

In Europe, work with the thallium salts has been extensive in Germany, Italy and England. Buschke and his collaborators [6] performed intensive and enlightening work along this line. Beginning in 1914, Buschke reported his first experiments in rats and concluded that alopecia produced by thallium salts is due to a nervous influence. Later, in a series of papers published in 1922 and the following years,[7] the same investigator arrived at the conclusion that thallium salts act through the endocrine glands, and observed that rats and tadpoles suffered a definite arrest of growth when they were fed with or received injections of solutions of thallium salts. In 1926, Buschke, Langer and Peiser [8] treated numerous children with tinea of the scalp with thallium acetate and concluded that this procedure is more effective than x-ray epilation. They also stated that tactile hairs which are under the influence of the central nervous system remain unaffected. This would explain the selective action of thallium on the hair of the scalp. In certain cases Buschke, Langer and Schayer combined roentgentherapy with the internal administration of thallium in small doses.

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4. Cicero, Ricardo E.: Personal communication to the authors, April 13, 1927.

5. Ureña, J. Gonzalez: Personal communication to the authors, Dec. 20, 1926.

6. Buschke and others: Abstr., J. Cutan. Dis. **32**:468 (June) 1914.

7. Buschke: Klin. Wchnschr. **1**:995, 1922; abstr., Arch. Derm. & Syph. **9**: 386 (March) 1924; Thallium and the Endocrine System, Med. Klin. **18**:731, 1922; abstr., J. A. M. A. **79**:510 (Aug. 5) 1922; Endocrine Lesions of Tadpoles from Thallium, Klin. Wchnschr. **1**:2182, 1922; abstr., J. A. M. A. **79**:2200 (Dec. 23) 1922. Buschke and Peiser, Endocrine Changes due to the Action of Thallium; abstr., Arch. Derm. & Syph. **7**:531 (April) 1923. Buschke and Jacobson: The Effect of Thallium, abstr., Arch. Derm. & Syph. **8**:241 (Aug.) 1923. Buschke; Klopstock, and Peiser: Action of Thallium, Med. Klin. **20**:345, 1924; abstr., J. A. M. A. **82**:1485 (March 16) 1924. Buschke; Langer, and Schayer: Thallium Epilation, München. med. Wchnschr. **73**:815, 1926; abstr., J. A. M. A. **87**:210 (July 17) 1926. Buschke and Peiser: Thallium and Tactile Hairs, Klin. Wchnschr. **5**:977, 1926; abstr., J. A. M. A. **87**:371 (July 31) 1926. Buschke; Peiser, and Klopstock: Acute Thallium Poisoning, Deutsche med. Wchnschr. **52**:1550, 1926; abstr. J. A. M. A. **87**:1872 (Nov. 27) 1926.

8. Buschke; Langer, and Peiser: Epilation by Thallium Acetate in Fungous Diseases of the Hair and Its Basis in Experiments, Dermat. Wchnschr. **83**:971, 1926; abstr., Arch. Dermat. & Syph. **14**:463 (Oct.) 1926.

In Italy, Felugo [9] reported favorable results with thallium in persons with tinea of the scalp, and stated that toxic phenomena were due to impurities of the drug.

Pasini [10] obtained 78 per cent of permanent cures in persons with ringworm of the scalp with the use of thallium. He could not demonstrate the presence of thallium in the hair or the skin, and in his opinion the alopecia is due to a temporary atrophy of the hair follicles.

Divella [11] reported his investigations on the epilating action of thallium salts and referred especially to the toxic phenomena that he observed: arthralgia, cephalea, abdominal pains, fever, loss of weight and general disturbances.

In animals fed with thallium, Mamoli [12] observed histologic lesions of the islands of Langerhans of the pancreas, erythropenia and leukocytosis, hyperglycemia and later, hypoglycemia in those with intense toxic phenomena.

Kleimman [13] treated 114 persons with tinea with good results but observed toxic manifestations in several cases. The hair of the scalp, under the trophic influence of the glands of internal secretion through the sympathetic nervous system, is the only hair affected; the hair of the rest of the body remains unaffected due to its being controlled by the central nervous system. A fringe of hair along the Celsus area and also the internal two thirds of the eyebrows are uninfluenced by thallium for the same reason.

In England, Drummond [14] reported good results in several patients with tinea whom he treated.

Dixon [15] reported experiments in animals in which epilation was produced by the use of the protoxide of thallium acetate. In his cases, the alopecia began on the back of the neck and on the back of the animal. He experienced the belief that thallium acts through the autonomic nervous system. He found thallium in all the tissues of the animal, and remarked that the skin contained a smaller quantity of the metal than any other tissue.

Davies [16] referred to the possible relation between alopecia produced by thallium and alopecia areata, and pointed out that the latter, in the light of modern experiences with thallium, may be due to some toxic agent acting on the endocrine system. He gave thallium, in doses of

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9. Felugo, G.: Riforma med. **42**:441 (May) 1926.
10. Pasini: Gior. ital. di dermat. e sifil. **67**:287 (April) 1926.
11. Divella, M.: Gior. ital. di dermat. e sifil. **67**:291 (April) 1926.
12. Mamoli, L.: abstr., Gior. ital. di dermat. e sifil. **67**:1502 (Oct.) 1926.
13. Kleimman: abstr., Gior. ital. di dermat. e sifil. **68**:1312 (Aug.) 1927.
14. Drummond, M.: Brit. M. J. **1**:329, 1927.
15. Dixon: Proc. Roy. Soc. Med. **20**:1197, 1927.
16. Davies, J. H. T.: Brit. M. J. **2**:79, 1927.

from 5 to 6 mg. per kilogram of weight, to two patients with alopecia areata and noticed marked toxic phenomena, especially pains in the legs, loss of sensation and paralysis.

Many other reports in the literature confirm the views expressed by the foregoing investigators.

According to Blythe,[17]

> Thallium was discovered by Crookes in 1861. Its atomic weight is 204, specific gravity 11.81 to 11.91; melting point, 290. It is a heavy diamagnetic metal, very similar to lead in its physical properties. The nitrate and sulphate of thallium are both soluble in water; the carbonate less so, requiring about 25 parts of water

Fig. 1.—Tinea of the scalp produced by *Microsporon felineum*. All the cases in which thallium was used were of this same type.

for solution, while the chloride is sparingly soluble—especially in hydrochloric acid. All the salts of thallium are poisonous. One of the earlier experimenters on the physiological action, Paulet, found one gram (15.4 grains) of thallium carbonate sufficient to kill a rabbit in a few hours; there were loss of muscular power, trembling of the limbs and death apparently from asphyxia. Lamy used thallium sulphate, and found that the dogs were salivated, and suffered from trembling of the limbs, followed by paralysis. The most definite results were obtained by Marmé who found that 0.04 to 0.06 of a soluble thallium salt, injected subcutaneously or directly into the veins, and 0.5 administered through the stomach of rabbits, caused death. The action is cumulative, and something like that of mercury; there are redness and swelling of the mucous membrane of the stomach,

17. Blythe: Poisons, Their Effect and Detection, London, C. Grifin and Co., 1920.

with mucous bloody discharges; hemorrhage may also occur from the lungs. Thallium is eliminated through the urine and is also found in the feces; it passes into the urine from 3 to 5 minutes after injection; the elimination is slow, often taking as long as three weeks. It has been found in the milk, in the tears, in the mucous membrane of the mouth, of the trachea, in the secretion of the gastric mucous membrane, and in the pericardial fluid—and in these places whether the poison has been introduced by subcutaneous injection or by any other channel. It seems probable that the reason for its being detected so readily in all the secretions, is the minute quantity which can be discovered by spectroscopic analysis.

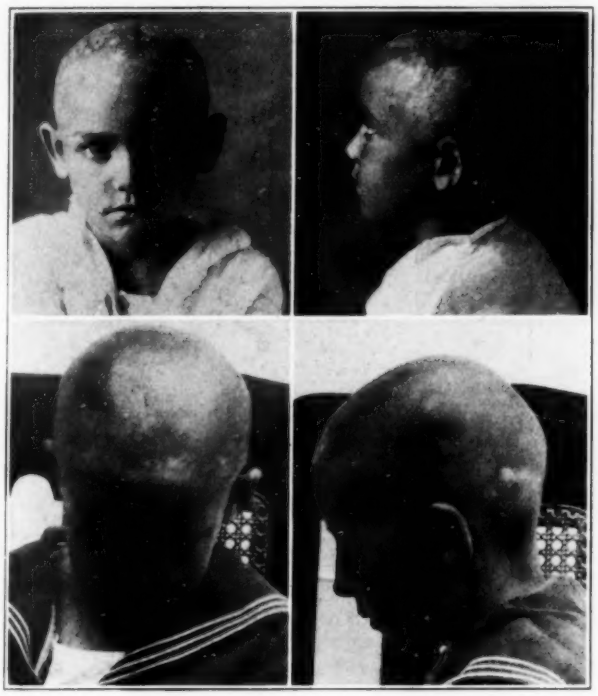

Fig. 2.—Alopecia produced by thallium. In the upper picture, some folliculitis and desquamation may be seen.

Paolo Flamm [18] noted that the administration of from 8 to 9 mg. per kilogram of weight does not have untoward effects in children of from 9 to 12 years of age. Sixteen days after the administration of the drug, the blood showed a 39 per cent increase of lymphocytes, an 80 per cent increase of eosinophils and 21 per cent of the total number of leukocytes. There was no appreciable variation of the calcium in the urine. In children above this age, thallium causes arthralgia and even tentaniform convulsions. The eosinophilia is the result of thymus stimulation; the arthralgia is attributed to parathyroid disturbance with excess of calcium

18. Flamm, Paolo: Biochem. e therap. sper. **13**:27, 1926.

excretion which, contrary to what happens in younger children, is not balanced by the involuted thymus.

In the United States, Felden of New York [19] reported good results in the treatment of forty-seven persons with tinea microsporica of the scalp. He warned against the use of thallium acetate in ointment form and also against the indiscriminate use of the salt by mouth by those not thoroughly familiar with its contraindications, dosage and possibilities, a view with which we entirely agree.

Summarizing, in the experience of numerous investigators thallium acetate produces a localized temporary alopecia of the scalp when administered by mouth in doses of from 5 to 9 mg. per kilogram of body

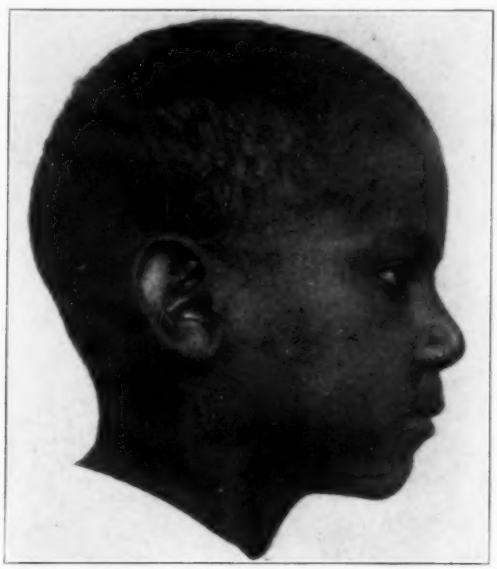

Fig. 3.—Normal regrowth of hair after thallium depilation.

weight. Alopecia is also produced in animals, but death occurs in most cases, and those which survive show arrest of development. Several cases in which serious toxic phenomena have occurred have been reported, particularly sialorrhea, pains in the legs, anemia, albuminuria, loss of sensation and even paralysis. The drug seems to act through the sympathetic and endocrine systems. This temporary alopecia of the scalp produced by thallium has been used in the treatment for tinea of the scalp with uniformily good results in the majority of cases. In subjects above 14 years of age, the use of thallium is contraindicated due to the intense toxic phenomena reported.

19. Felden, Botho F.: Epilation with Thallium Acetate in Treatment of Ringworm of Scalp in Children, Arch. Dermat. & Syph. **17**:182 (Feb.) 1928.

PERSONAL INVESTIGATIONS

Protoxide of thallium acetate is obtainable in the market in the form of white crystals soluble in water and alcohol. The preparation that we used was especially manufactured in Germany and obtained through the courtesy of Dr. Theodore Johnson, professor of the School of Pharmacy of the University of Havana, and was the purest product procurable.

One gram of the crystals was dissolved in 100 cc. of distilled water, 1 cc. containing 10 mg. of the product.

The dose used for children was 7 mg. per kilogram of body weight in the majority of cases and 8 mg. in a few patients. The salt was diluted in water and was given all at one time, usually about 10 a. m., three hours after a light breakfast. The dose varied from 120 to 240 mg. according

Fig. 4.—Normal regrowth of hair after thallium depilation.

to the weight of the patient. In all cases, only one dose was administered.

Altogether, thirty-two children were treated; practically all were from a children's institution, ringworm of the scalp being rare in Havana. They were all healthy and ranged in age from 3 to 12 years. Six were colored and twenty-six were white. One of the children was a girl and the other thirty-one were boys. In twenty-seven cases the dose was 7 mg. per kilogram, and in five cases 8 mg. was employed. All these children were affected with tinea microsporica of the scalp produced by *Microsporon felineum*. An immediate reaction did not occur in any case, and since the preparation is entirely odorless and tasteless the patients took it fully and willingly.

In examinations of the blood and urine performed at intervals during the weeks following the administration of the thallium salt, the results

were all negative. In a few cases, a trace of albumin was noted for a few days. In one case, there was slight increase in lymphocytes.

Untoward Reactions.—In a child, aged 3 years, who had taken a dose of 7 mg. per kilogram, there was a crisis of diarrhea twelve days after the administration of thallium.

In a child, aged 11 years, who had taken 8 mg. of thallium per kilogram, pains in the legs and diarrhea occurred one week after the drug was taken. The child was practically confined to bed for three weeks.

In a child, aged 8 years, who had taken 7 mg. of thallium per kilogram, moderate pains in the legs, sialorrhea and pallor were present fifteen days after the ingestion of the thallium salt.

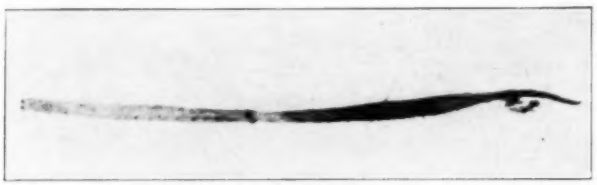

Fig. 5.—Exclamation point hair after thallium depilation.

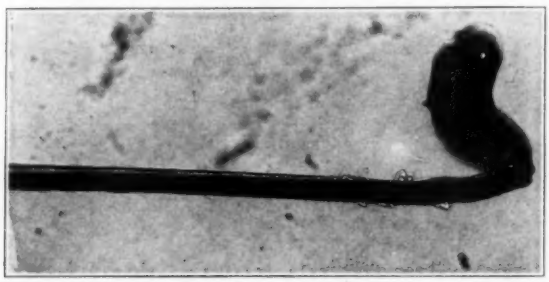

Fig. 6.—Hooked hair bulb after thallium depilation.

In a child, aged 7 years, who had taken 8 mg. per kilogram, profuse diarrhea occurred one week after the administration of thallium.

These four patients were the only ones who suffered slight toxic symptoms without any further consequences. In all the other twenty-eight cases the children continued to play, eat and sleep normally.

In nine cases there was folliculitis of the scalp after depilation of the same type often observed after roentgen treatment. The scalp of these as well as the other patients was rubbed daily with an ointment containing 3 per cent of white precipitate.

Results.—From seven to nine days after the ingestion of thallium, the hair of the scalp could be pulled off, without any pain, except in the area of Celsus, in which the hair often remained firm throughout the experiment. From eight to eighteen days, but usually about fourteen

days, after the ingestion of thallium, the hair fell off, but generally it was necessary to pull it off with the fingers or with forceps. The alopecia was complete in about twenty-one days.

If the scalp is not mechanically depilated, many hairs remain in their follicles, and the regrowth begins before the alopecia is completed, endangering the new hair.

Results Obtained in the Treatment of Thirty-Two Patients With Tinea With Thallium

Number	Age	Race	Sex	Weight, Kg.	Amount of Thallium, Mg.	Beginning of Fall of Hair, Days	Complete Alopecia, Days	Beginning of Regrowth, Days	Complete Normal Regrowth, Days	Comment
1	8	W	M	21	147	15	..	25	83	Quick regrowth
2	8	C	M	22	154	..	23	32	120	
3	6	W	M	22	154	9	18	24	90	Folliculitis
4	7	W	M	20	140	..	..	..	116	
5	8	W	M	22	154	10	21	42	56	Pains in legs; salivation
6	6	W	M	23	160	7	22	36	80	
7	6	C	M	19	133	13	20	27	76	
8	6	W	M	20	140	..	21	26	82	
9	8	W	M	20	140	13	21	48	123	
10	7	W	M	26	184	14	22	35	46	
11	10	W	M	30	210	14	21	49	73	Folliculitis
12	5	W	M	18	126	14	21	35	70	Folliculitis
13	6	C	M	23	160	14	21	28	70	Slow growth on spots affected by tinea
14	8	C	M	22	154	9	21	42	109	Slow growth on spots affected by tinea
15	5	W	M	17	119	14	21	29	62	Quick regrowth
16	7	W	M	22	154	16	28	42	89	Folliculitis
17	7	W	M	20	140	14	21	38	87	Slow growth on spots affected by tinea
18	8	W	M	24	172	..	..	..	109	
19	8	W	M	23	160	14	21	36	124	Slow growth on spots affected by tinea
20	8	W	M	24	168	17	..	..	...	Returned with a full growth
21	7	W	M	23	160	..	24	46	115	Folliculitis
22	7	W	M	19	133	13	15	23	...	Reinfection
23	7	W	M	21	168	18	25	32	80	Diarrhea
24	7	W	M	22	176	7	28	49	70	Slow growth on spots affected by tinea
25	8	W	F	14	112	7	21	..	110	Diarrhea
26	6	W	M	18	144	..	21	31	54	Quick regrowth
27	11	W	M	30	240	14	28	34	74	Pains in legs
28	7	C	M	20	140	14	21	42	70	
29	6	W	M	18	128	14	21	33	82	
30	7	C	M	20	140	14	21	27	102	Quick regrowth
31	7	W	M	20	140	14	21	28	86	Quick regrowth
32	10	W	M	29	200	14	21	28	92	Quick regrowth

Regrowth commenced in from twenty-two to forty-nine days after the administration of thallium, with an average of thirty-three days. In three of our cases the regrowth of hair was so precocious that it occurred before the depilation was completed. In one of these cases the treatment was a failure, as when the new hair grew, it became reinfected. This is perhaps the only serious drawback of treatment with thallium as compared with the x-rays, as shown in the accompanying table.

Peculiarities of the Hair.—The falling hair presents peculiarities which we believe are interesting. Some hairs are deformed, crooked or broken; others are thickened and thinned in alternation, as in aplasia moniliformis, and others affect the exclamation point shape so commonly seen in alopecia areata. These observations bear an exceptionally important relation to the etiology of alopecia areata, since, we believe, they are equivalent to the experimental production of this disease with the thallium salt in man. As we shall undertake to demonstrate later, thallium alopecia and these dystrophic changes of the hair are due to

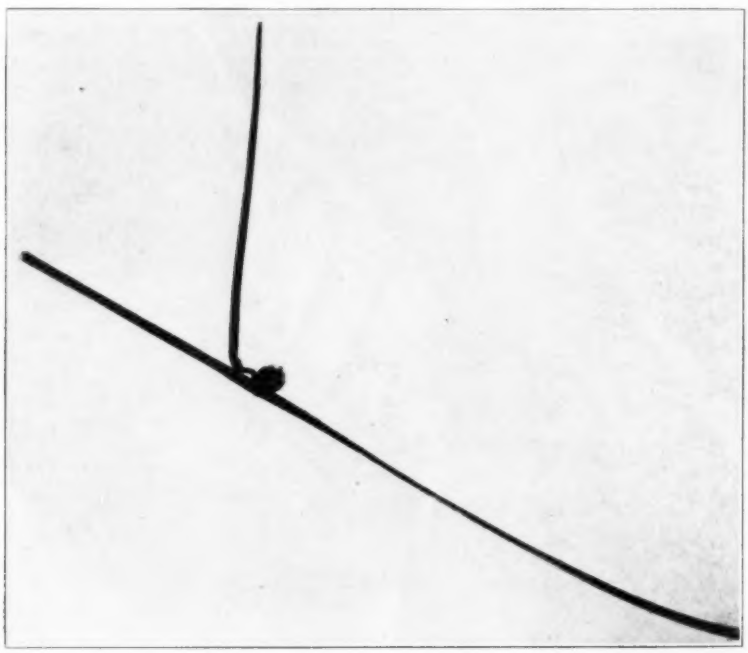

Fig. 7.—Alternately thinned hair and hooked hair bulb after thallium depilation.

thyroid dysfunction, which may also be the case in alopecia areata, as has already been pointed out by many investigators. It is known that alopecia areata often responds well to thyroid therapy.

The regrowth of hair also offers certain peculiarities which are worthy of note. The hair begins to grow as a fine duvet of a light color and is almost colorless in certain cases. Later, some sparsely situated hairs appear thickened, like horsehair, and gradually the whole scalp is covered by short thick hairs which finally become normal. It is remarkable how the hairs are not all of the same size, some remaining short while others become quite long. In our cases the hair was normally regrown between forty-six and one hundred and twenty-four days, with an average of eighty-two days. We have not observed any noticeable

change in the color or shade of the hair after its regrowth. Other investigators have pointed out the change from wavy hair to straight hair, or vice versa, and sometimes a change of color.

It is also interesting to note that in some cases a longer time is required for the hair on the patches of tinea to come off and to regrow, so that practically all the scalp may be covered with new hair, while the old patches of ringworm are still bald.

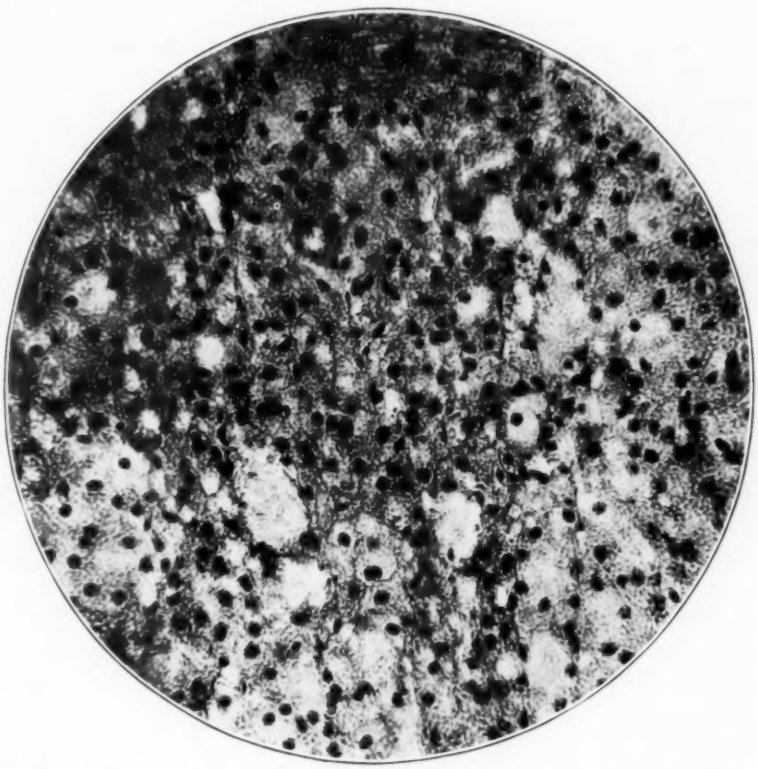

Fig. 8.—Section of suprarenal gland of rabbit killed with thallium acetate.

EXPERIMENTAL WORK

In endeavoring to prove the mode of action of thallium acetate, we performed a series of experiments, making subcutaneous injections and administering by mouth variable amounts of the drug in cats, dogs, guinea-pigs and rabbits.

Guinea-Pig A.—An adult animal weighing 300 Gm., was given 6 drops of a 1 per cent solution of thallium acetate by mouth; this represented 10 mg. per kilogram of body weight. Ten days later, the hair could easily be pulled off the back of the animal. Signs of poisoning were not present. Twenty days later, the hair could still be pulled off. There was no spontaneous alopecia. The animal remained well.

Guinea-Pig B.—An adult animal weighing 300 Gm., was given 12 drops of a 1 per cent solution of thallium acetate by mouth; this represented 20 mg. per kilogram of weight. Ten days and twenty days later the hairs could be pulled off, but spontaneous alopecia did not occur. The animal remained well. It is interesting to note that the hair of the animal was deformed, presenting the alternately thickened and thinned appearance which reminds one of aplasia moniliformis.

Guinea-Pig C.—An adult animal, weighing 335 Gm., was given 24 drops of the same thallium solution; this was equivalent to 40 mg. per kilogram of weight. Two days later, the animal crouched in the cage and refused to eat. It died the next day, and autopsy was performed immediately after death. Intense congestion of all the viscera was present. Unfortunately the pieces removed for microscopic examination were lost.

Guinea-Pig D.—Into an adult animal weighing 312 Gm., a subcutaneous injection was made of a solution containing 2.5 mg. of thallium acetate. Five days later, the animal died. The hair of the back could be pulled off. The viscera were congested, especially the liver. The thyroid was small and was lost in the surrounding connective tissue. Sections from the thyroid and suprarenals were

Fig. 9.—Effect of thallium acetate on the growth of the cat. The animals were brothers and were born on the same day. The animal at the right of the picture was fed 8 mg. of thallium acetate four weeks after birth. The photograph was taken two months later.

made. Atrophy and parenchymatous degeneration were found. Sections of the skin showed empty hair follicles and slight perifollicular infiltration of round cells.

Dog.—A black mongrel, weighing 6 Kg., was fed 48 mg. of thallium acetate; this was equivalent to 8 mg. per kilogram. The animal remained well during the one month it was under observation. The hair of the abdomen could be pulled off in small tufts. Disturbance of the general health of the animal was not observed.

Cat A.—A black and white animal, aged 4 weeks, weighing 308 Gm., was fed 15 mg. of thallium acetate in milk. Six days later, the animal would not eat and had profuse diarrhea. Three days after this, the animal regained his normal status and ate and played normally. Twelve days afterward, the hair of the back came off when pulled. The animal suffered a noticeable arrest of growth. Compared with those of a normal brother at the end of two months, his size and weight were about one half those of the normal animal.

Cat B.—Into a brown animal, aged 3 weeks, weighing 330 Gm., a subcutaneous injection was made of a solution of thallium acetate equivalent to 8 mg. per kilo-

gram. The animal died three days later. The autopsy, performed several hours after death, showed only the usual postmortem changes. The viscera were not sectioned.

Rabbit.—Into an adult male animal, weighing 1.5 Kg., a subcutaneous injection was made of a solution of thallium acetate containing 12 mg., equivalent to 8 mg. per kilogram of weight. The animal remained well for ten days, and the hair of the back came off when pulled with the fingers. Twelve days later, the whole dorsum of the animal was alopecic. The animal died suddenly. Autopsy, performed immediately after death, revealed atrophy of the spleen, enormous dilatation of the intestines, congestion of the lungs and atrophy of the thyroid and suprarenals, which were found only after minute search of the conjunctive tissue and had to be sectioned together with a mass of the surrounding magma.

Microscopic sections showed cloudy swelling and parenchymatous degeneration of the cells of the suprarenal glands, atrophy and flattening of the cells of the thyroid gland, passive congestion of the liver and perifollicular infiltration of the skin.

From these observations, it may be concluded that the drug probably acts through the endocrine system, as shown by the atrophy of the thyroid and suprarenal glands and by the arrest of growth of one of the surviving animals. The drug is a great deal more active and more toxic when injected subcutaneously than when given by mouth.

We may assume that the fall of hair caused by the administration of thallium acetate is due to thyroid dysfunction, which causes a partial syndrome of thyroid insufficiency. In adults, the symptoms of endocrine dysfunction are so intense that the drug cannot be administered, as we have said, to patients over 14 years of age. This may be due to the absence of the action of the thymus secretion, which is still present in children, and also to the rapid development of the sexual glands.

SUMMARY AND CONCLUSIONS

1. The treatment for tinea of the scalp in children by the administration of the protoxide of thallium acetate has given good results in our experience. Thirty-two patients were treated by the oral administration of from 7 to 8 mg. per kilogram of body weight. Thrty-one were apparently cured. In one case, the disease recurred because of the early reposition of hair before the infected hair had been completely eliminated. In this case, the child had disappeared from observation for three months.

2. Seven milligrams of the drug per kilogram of weight are sufficient to produce a complete alopecia in about twenty-one days. A few children presented slight symptoms of intolerance, such as diarrhea, sialorrhea and pains in the legs. A severe reaction did not occur in any case.

3. Changes in the hair, which consisted of deformities such as hairs the shape of an exclamation point, hooking of the hair bulb and alternately thinned hair, were noted several days after the administration of thallium. These changes are similar to those found in alopecia areata.

These trophic changes in the hair may be of some importance in the etiology of alopecia areata. The observations of Davies [16] confirmed this view. We believe that alopecia produced by thallium amounts to the experimental production of alopecia areata in man.

4. Three guinea-pigs were given a dose of 10, 20 and 40 mg. per kilogram of the thallium salt by mouth. The loss of hair in these animals was slight and never complete. The doses of from 10 to 20 mg. were well tolerated by the animals. The dose of 40 mg. killed the animal in three days. A subcutaneous injection of 2.5 mg. of the thallium salt was made into one guinea-pig. It died in five days. Slight loss of hair, marked visceral congestion and atrophy of the thyroid gland and of the suprarenals were found. Parenchymatous degeneration was found in these glands. Changes in the skin were unimportant except for the absence of hair. A mongrel, adult dog was given 8 mg. per kilogram of weight by mouth. The animal did not suffer any inconvenience and remained well for a month. The hair of the abdomen could be pulled off with the fingers, but spontaneous alopecia did not occur. A cat, aged 4 weeks, was given 15 mg. of thallium acetate by mouth. The animal suffered from diarrhea for a few days but afterward remained well. Development was arrested, after two months the animal being about one-half the size of its brother born at the same time. A dose of 8 mg. injected subcutaneously killed a cat, aged 3 weeks, in three days. An adult rabbit was killed in twelve days by a subcutaneous injection of 8 mg. per kilogram. Atrophy and parenchymatous degeneration of the thyroid, spleen and suprarenals were found.

5. In our opinion, thallium acetate produces a temporary arrest of the trophic action of the endocrine glands, probably the thyroid, on the growth of hair.

6. Epilation by means of the administration of thallium acetate compares favorably with epilation produced by the x-rays. Good general health of the patient and a complete understanding of its limitations, possibilities and contraindications are indispensable before treatment of tinea of the scalp with thallium salts is undertaken.

7. However, in effecting depilation of the scalp with thallium we are using a dangerous drug, which, we believe, acts by producing a disturbance of the glands of internal secretion. The effects seem temporary, but it remains to be demonstrated whether any permanent injury is afflicted on such a subtle, and as yet mysterious, physiologic complex as the endocrine sympathetic system. In our opinion and in spite of the simplicity of thallium therapy, x-ray depilation is still the method of choice in the treatment for tinea of the scalp.

ABSTRACT OF DISCUSSION

DR. WILLIAM ALLEN PUSEY, Chicago: I have been impressed with the great practical value of thallium in the treatment for tinea. Dr. C. A. Earle practices in one of the suburbs of Chicago, and has charge of a Catholic institution for children. He has made the life of dermatologists miserable by his cases of ringworm of the scalp, but he told me casually not long ago that he had eradicated this disorder by using thallium. He has not had any serious reactions from the use of the drug and has eradicated the disease from that institution. He is intelligent and progressive and is capable of examining his patients and determining the presence of ringworm. He reports that tinea is no longer a problem with him.

DR. HARTHER L. KEIM, Ann Arbor, Mich.: Shortly before leaving Pekin, I started administering thallium acetate to children with ringworm of the scalp. My experience with the drug closely paralleled that of Dr. Pardo-Castello. In all of the children epilation occurred, but in several of the older boys signs of intolerance developed, which manifested itself especially as a peripheral neuritis and albuminuria. The work is being continued, and I believe that a report will be published when epilation has been effected in a sufficiently large number of cases.

DR. E. L. OLIVER, Boston: At the Massachusetts General Hospital, there was a small group of patients who responded in much the same manner that Dr. Pardo-Castello has reported. I recall one case in which complete epilation did not occur, but epilation did take place on the areas affected with ringworm and a cure resulted.

DR. CHARLES M. WILLIAMS, New York: I have had some experience with this therapy and have had a few patients in whom epilation was not complete. I would like advice as to how to treat them. Is it safe to give a second dose of the thallium acetate, and if so, at what interval? Also, is it safe to epilate with the roentgen ray, and if so, at what intervals?

DR. W. H. GOECKERMAN, Rochester, Minn.: I should like to know the effect of thallium acetate on lanugo hair and on the axillary and pubic hair, if it is present. Also, what is the difference in the action of the drug in the adult?

DR. C. GUY LANE, Boston: In the group of cases Dr. Oliver mentioned, I was impressed with three things: first, the time at which the epilation begins. With thallium acetate, it begins sooner than with the roentgen ray. Second, I was impressed with the deformities of the hairs which are left in the scalp, and third, by the evidence in the hair of the action of the thallium as compared with the action of the roentgen ray. Dr. Pardo-Castello has shown that under the influence of thallium there is a gradual tapering of the hair similar to that which occurs in alopecia areata. After the x-rays are used, there is an abrupt inhibition of growth of hair manifested by sudden loss of pigment and a marked decrease in diameter of the hair. The hair drops out if the x-ray dose has been sufficient to produce complete inhibition, but after a slightly smaller dose there is a gradual increase in the appearance of pigment and in the size of the hair shaft after this sudden change has manifested itself. I think that the regrowth in these cases has been much more rapid than the regrowth after roentgen therapy.

DR. JEFFREY C. MICHAEL, Houston, Texas: I should like to know whether it is safe to use this method of treatment in ambulatory patients.

DR. PARDO-CASTELLO: In regard to the incomplete epilation, I have seen such cases reported but did not encounter any in my group. I have treated forty-five patients altogether. I do not see that anything can be done in these cases except to wait a sufficient length of time before giving a second dose of thallium acetate. This should not be done within three months, and it is safer to give it later. Just

as in roentgen therapy, it is safer to wait a sufficient length of time before giving a second dose. I would not advise the use of the roentgen ray in association with the thallium acetate. I do not know what the result would be, but I fear that the resistance of the hair follicle would be decreased by the roentgen ray. Some workers have used a one-half dose of thallium and one-half dose of roentgen ray and some have reported good results.

Answering Dr. Goeckerman, thallium acetate has a specific action on the hair of the scalp, perhaps because this hair is under the direct control of the endocrine system, whereas this is not true in the other areas. In patients beyond 14 years of age the procedure is entirely contraindicated because of the serious toxic manifestations. In adults the symptoms of neuritis and endocrine disturbance are severe and serious at times. Perhaps the coming into play of the sexual glands has some bearing on the subject.

Dr. Lane spoke of the deformities of the hair. We have found the moniliform and exclamation point types in the remaining hair, but never in the new growing hair. The exclamation point type is exactly the same as that we find in persons with alopecia areata of the scalp.

Concerning the treatment of ambulatory patients, I think that is quite safe. None of the patients we have treated has remained in the hospital. They take the dose at about 10 a. m. and then go home. We have seen them every day during the first few days and then every week, allowing them to remain out of the hospital all the time.

DERMATITIS EXFOLIATIVA NEONATORUM (RITTER'S DISEASE) *

W. H. GUY, M.D.
AND
MORTIMER COHEN, M.D.
PITTSBURGH

In 1878, Ritter,[1] of Prague, reported 297 cases of an acute noncontagious disease of infants which was characterized by a rapidly developing erythema, dermatitis and exfoliation with a lack of general manifestations, and accounting for a mortality approaching 50 per cent. The condition had been endemic in a foundling asylum under his supervision during the foregoing ten years. In 1868 and 1870, he had described cases, but under the title of dermatitis erysipelatosa. The onset of the condition was usually between the end of the first and the fifth week of extra-uterine life. The most frequently noted early symptom was an erythema about the mouth which rapidly spread over the entire body. Exfoliation of the outer layers of the epidermis occurred, exposing red glazed patches of the mucous layer, the appearance being similar to that following a scald. Fissures at the angles of the mouth were common, and grayish exudate covered patches were frequently seen on the mucous membranes of the mouth. Vesicles or bullae were infrequently seen and when they were present they were flaccid, occurring usually as part of an atypical onset and later giving way to the usual picture. In most cases, the epidermis could be rubbed off on involved areas. General symptoms were characteristically absent, and the infant, although looking miserable, fed normally and did not lose weight. The condition lasted from seven to ten days, the regeneration of epithelium occurring rapidly in favorable cases. Pneumonia, erysipelas, furuncles, eczema and gangrene were not infrequent complications. Death occurred as the result of exhaustion or complications.

OPINIONS BEARING ON ETIOLOGY

Ritter considered the condition of pyogenic origin, but was unable to prove his contention. He considered irritation of the skin, hot baths and sudden cooling of the skin after baths, or bad hygiene, to be predisposing. He thought that the condition in the typical case began as an

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* From the Departments of Dermatology and Pathology, University of Pittsburgh.

* Read at the Fifty-First Annual Meeting of the American Dermatological Association, Washington, D. C., April 30, May 1-2, 1928.

1. Ritter, von Rittershain G.: Centralbl. f. Kinderh. **1**:3 (Oct.) 1878.

oral or conjunctival infection and spread to the skin. In 1879, Behrend [2] discussed Ritter's communication and placed the condition under Cazenave's pemphigus foliaceus. Ritter,[3] in answer to this article, pointed out that pemphigus foliaceus was universally fatal and that the regeneration of epithelium did not occur in that disease. He further pointed out the age of the patients, the rapidity of advance of the disease, the exfoliation of great sheets of the epidermis, the primary reddening of the skin, etc., as points indicating the identity of the condition described in contradistinction to pemphigus foliaceus. Kaposi,[4] Caspary,[5] Elliot [6] and others considered the condition related to Kobner's epidermolysis bullosa herediteria. Dorland [7] reported a case in which it was suggested that the eruption was an exanthem contracted in utero indirectly from another child sick with scarlatina. White [8] attributed to asphyxia a case that developed after exposure to carbon monoxide gas. Winternitz [9] recorded three cases, and thought the disease might be explained theoretically as follows: (1) local bacterial infection; (2) a vasomotor disturbance; (3) an increase in the normal exfoliation of the new-born, and (4) a nutritional disorder of the epidermis. He recovered a staphylococcus from the blood in one case. Pateke [10] recovered a diplococcus from vesicles and agreed with the etiologic ideas of Ritter. Postmortem examinations were made by Ritter and several other investigators with generally negative results, and the bacteriologic observations were inconclusive. Luithlen [11] stressed the etiologic relationship of toxic erythema and physiologic desquamation in infancy. Bender [12] thought that the condition was of trophic or vascular origin. Baker [13] reported a case in which he considered the eruption secondary to pyemia developing atfer cord infection. Stelwagon [14] and several other American and British authors considered the condition a form of "pemphigus neonatorum." Hedinger [15] thought that only a difference in degree existed

2. Behrend, G.: Vrtljschr. f. Dermat. **6**:191, 1879.
3. Ritter, von Rittershain, G.: Arch. f. Kinderh. **1**:53, 1880.
4. Kaposi, M.: Path. u. Therap. Haut., ed. 3, Berlin, Urban & Schwarzenberg, 1887, p. 372.
5. Caspary, J.: Vrtljschr. f. Dermat. u. Syph. **2**:122, 1884.
6. Elliot, G. T.: Am. J. M. Sc. **45**:1, 1888.
7. Dorland, W. A. N.: Philadelphia Polyclin. **5**:385, 1896.
8. White, D. K.: J. Cutan. & Genito-Urin. Dis. **13**:341, 1895.
9. Winternitz, R.: Arch. f. Dermat. u. Syph. **44**:398, 1898.
10. Pateke, A. J.: J. Cutan. Dis. **22**:269, 1904.
11. Luithlen, F.: Handbuch der Hautkrankheiten, Mracek, Alfred Holder, 1902, p. 757.
12. Bender, O.: Virchows Arch. f. path. Anat. **159**:86, 1900.
13. Baker, B. M.: New York M. J. **83**:1185, 1906.
14. Stelwagon, H. W.: Diseases of the Skin, Philadelphia, W. B. Saunders Company, 1921, p. 199.
15. Hedinger, E.: Arch. f. Dermat. u. Syph. **80**:349, 1906.

between Ritter's disease and what is recognized as bullous impetigo, this opinion being advanced by numerous authors before and since his communication. Carlton,[16] in reviewing the cases reported from 1878 to 1907, found that approximately half of the cases were preceded by eczema, intestinal irritation or umbilical infection. Skinner [17] advanced the hypothesis that the condition was due to the circulation of a hemagglutinin which produced an intra vitam clotting. Hazen [18] recovered a staphylococcus from the local lesions and classed the condition as a primary cutaneous staphylococcic infection. Ronchi [19] considered Leiner's erythrodermia and Ritter's disease identical.

QUESTIONABLE CASE REPORTS

With such widely divergent views it is not surprising that there have appeared in the literature reports of cases under the title of dermatitis exfoliativa neonatorum that did not present the classic picture pointed out by Ritter. Spencer [20] reported twenty-five cases characterized by a bullous eruption on the trunk with peripheral extension, and found the condition both infectious and contagious. Brown [21] reported a group of cases, epidemic in type, transmitted by direct or indirect contact and associated with a source of infection, such as paronychia, infected cords, etc., and further characterized by an elevation of temperature. McCairns [22] reported an extensive seropurulent bullous eruption as an example of Ritter's disease. Numerous such reports are available. Thus, one may read reports that suggest bullous impetigo, acute infectious eczematoid dermatitis, eczema; erysipelas, toxic erythema, etc., as the more probable diagnoses. In his original communication, Ritter indicated that the onset of the condition in an occasional case might be elsewhere than on the face, that the early eruption might simulate a miliaria, a "pemphigus neonatorum" or an eczema, but that there always ensued the classic erythema with exfoliation and the primary picture was entirely lost. Fisher's [23] case exemplified this point. The absence of a rise in temperature and the noncontagious character of the condition were also stressed in the original communication; it was definitely stated

16. Carlton, E. P.: New York M. J. **86**:573, 1907.
17. Skinner, E. F.: Brit. J. Dermat. **22**:75, 1910.
18. Hazen, H. H.: J. Cutan. & Genito-Urin. Dis. **30**:325, 1912.
19. Ronchi, A.: Exfoliative Dermatitis and Erythrodermia, Pediatria **33**:131, 1925; abstr., J. A. M. A. **84**:926 (March 21) 1925.
20. Spencer, W.: Australasian M. Gaz. **18**:225, 1899.
21. Brown, W. R.: Dermatitis Exfoliativa Neonatorum, J. A. M. A. **49**:1670 (Nov. 16) 1907.
22. McCairns, R.: Brit. M. J. **1**:186, 1923.
23. Fisher, J. E., and Wittenberg, S. S.: Dermatitis Exfoliativa Neonatorum, Arch. Dermat. & Syph. **10**:289 (Sept.) 1924.

that in the entire series no cases of contagion occurred and that all cases were afebrile, unless complicated. It seems not unreasonable to suggest that Ritter's disease is much more rare than the rather numerous reports would indicate and, therefore, the following study of a case that meets the clinical postulates of Ritter may be of interest.

REPORT OF A CASE

History.—On Dec. 26, 1926, after a gestation of eight months a primipara gave birth to a male infant, weighing 2,225 Gm. Respiration was delayed, and insufflation produced a satisfactory respiration twenty minutes after birth. The labor had been normal, but long. The child progressed normally until forty-eight hours after birth when an erythema appeared about the mouth and chin, which became universal within twenty-four hours.

Course.—During the ensuing forty-eight hours, exfoliation of the superficial epidermis in large sheets occurred, exposing red, slightly oozing surfaces of various sizes in the midst of the universal erythema. The first exfoliation occurred

Fig. 1.—Infant photographed during the eighth day of life.

where the erythema first appeared about the mouth and chin; later, widely separated patches appeared. Nikolsky's sign was present. Fissures developed at the angles of the mouth, nares and eyes. Erosions were noted on the buccal mucosa. At no time during the course of the condition were vesicles or bullae noted. The child nursed regularly, had normal stools and did not appear very ill during the first several days of the disease. Then increasing weakness and inability to nurse necessitated the institution of nasal feedings, which were retained. The stools which had been normal, showed some mucus and small amounts of macroscopic blood. The temperature remained normal until the eighth day when there occurred a sudden elevation to 102 F., at which point approximately it was maintained until death on the ninth day of the disease. The infant's weight at death was 2,275 Gm. The Wassermann reaction was negative in both mother and child. The treatment comprised the application of artificial heat, bland oils and supportive measures. It was noteworthy that no cases of impetigo or allied infections were in the hospital at the time of onset of the condition and that subsequently such cases did not develop in spite of the fact that the child was not isolated until the fourth day of the disease. A general physical examination revealed nothing of importance, and cultures made from the involved areas demonstrated a variety of organisms that could hardly be considered of etiologic significance.

Observations at Autopsy.—The body came to autopsy six hours after death; it was well developed and measured 51 cm. in length. The entire body was involved in the desquamation described. The skin, even in the nondesquamated areas, was loose so that it could be peeled off like the skin of an onion. The denuded areas

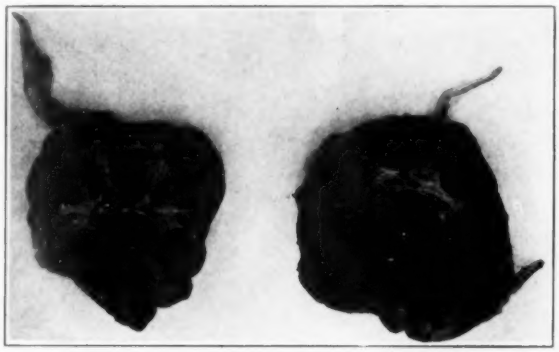

Fig. 2.—Hemorrhagic cyst in the suprarenal.

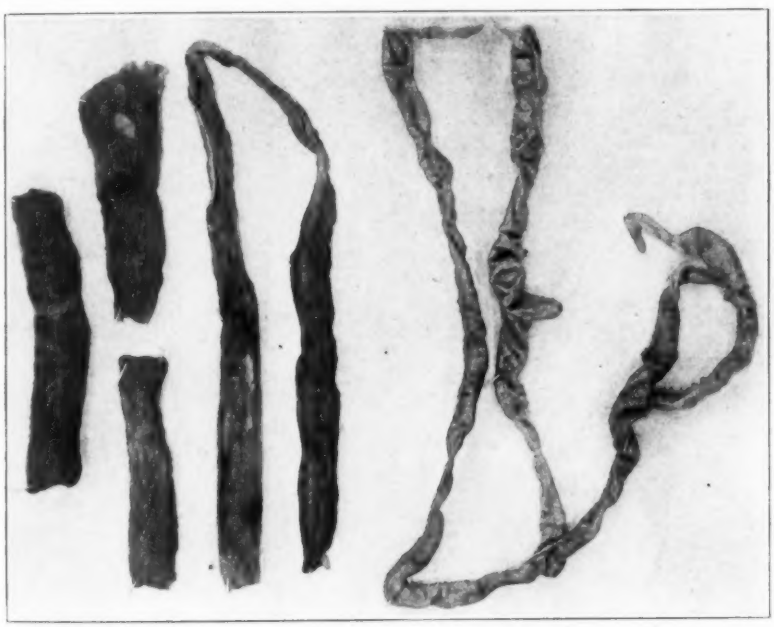

Fig. 3.—Lesions in the intestine and Mechel's diverticulum.

were angry red and peculiarly dry. The brain showed a small blood clot, 2 by 0.5 cm. in diameter, over the right parietal region bordering the superior longitudinal fissure. The thymus was moderately large. The lungs were involved in a beginning pleuritis which consisted of a thin fibrinopurulent exudate; congestion and edema of the lungs proper were present. The pericardium contained

an early fibrinopurulent exudate, and the heart itself presented a few petechiae on the epicardium. There was an early generalized fibrinopurulent peritonitis with distention of the stomach, ileum and colon. A well developed Meckel's diverticulum was found in the ileum. The cecum was elongated and of the infantle type. The mucosa of the stomach showed nothing of note. The jejunum presented numerous

Fig. 4.—Lesion of the skin at the point of separation of the stratum corneum.

shallow ulcers, irregular in size and shape, with raw looking red bases, resembling the lesions of the skin. The ileum showed fewer such lesions. Peyer's patches were more prominent than usual. One ulcer was seen in the lower sigmoid. The liver, pancreas, spleen and kidneys showed the changes usual in an acute infection. The right suprarenal gland was four times the size of the left, which was itself somewhat larger than normal. The enlargement was due to a hemorrhagic cyst

which occupied the center and lower pole of the suprarenal gland; its contents were red, gelatinous and stringy. The genitalia and bladder were normal. Microscopically, the tissues from all parts of the body showed definite engorgement. A fair number of eosinophils were found in the stroma of the thymus. The lungs, heart, aorta, lymph nodes, pancreas, spleen, liver, kidneys and bladder were of relatively little interest microscopically. The suprarenal gland presented a picture of hemorrhagic suprarenal adenitis with practically no cellular reaction in addition to blood cells. The bone marrow showed an excess of eosinophilic myelocytes.

Sections from the intestines and skin were of considerable interest. The sections from the uninvolved areas of intestine showed relatively undisturbed histology

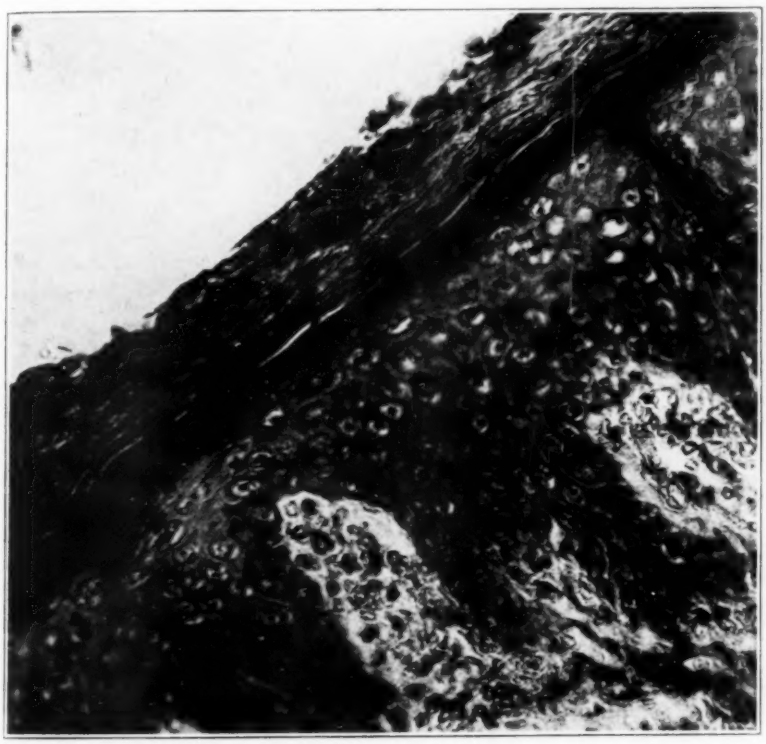

Fig. 5.—Skin with thickened stratum corneum; microscopic section of intact skin.

except for congestion and scattered eosinophilic infiltration. The involved portions and those just bordering on the ulcerated areas showed an interesting picture. In these areas with intact mucosa, the dilatation and engorgement of the blood vessels were often great enough to distort the glands. The submucosa showed the most striking change; because of edema and vascular distention it was often four times the thickness of the mucosal layer. The blood vessels were tremendously dilated with swollen endothelium. It was noteworthy that wandering cells were comparatively few, consisting, for the most part, of large endothelial leukocytes with pink cytoplasm. Occasionally, a polymorphonuclear leukocyte or an eosinophil was seen. This thickening of the submucosa caused a lifting of the mucosa and,

where it was most marked, caused a separation of the mucosa as though stripped from the underlying structures. The muscularis was also edematous and in places fragmented. The nerve plexuses were prominent due to edema.

The stratum corneum of the skin was unusually thick for an infant. It was composed of a homogeneous pink-staining substance in which were areas of blue-staining débris. On the surface was a thin crust composed of hemolyzed blood

Fig. 6.—Denuded area of the skin, showing congestion, edema and hemorrhage of the capillary, with notable lack of inflammatory infiltration.

and fibrin. The deeper layers of the corneum were parakeratotic. The stratum granulosum was easily identified. The stratum mucosum presented parenchymatous and interstitial edema and varied materially in thickness, the suprapapillary rete particularly being thinned in places. The stratum germinativum was also edematous and presented numerous mitotic figures. The corium was markedly edematous and the papillae were swollen, containing distended capillaries with marked swelling

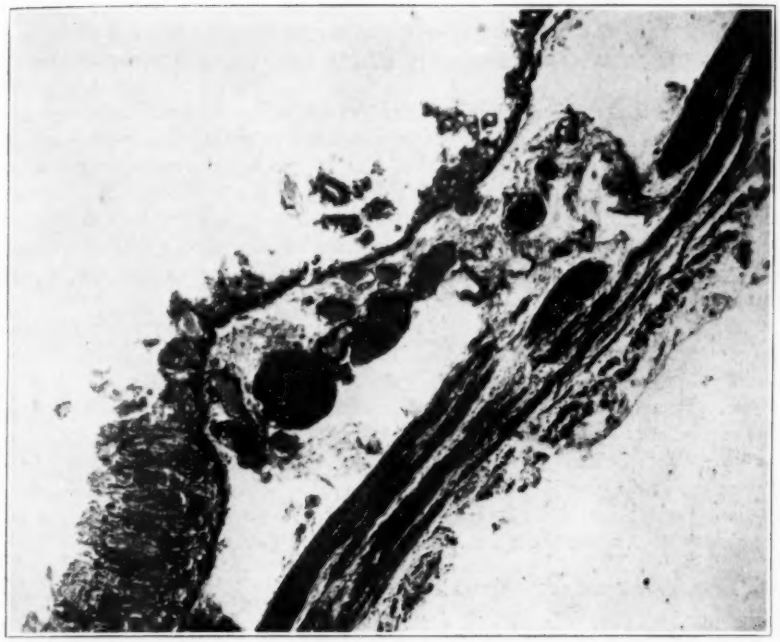

Fig. 7.—Intestinal lesion, showing congestion, edema and a lack of inflammatory infiltration.

Fig. 8.—Bacteria in the crust only.

of their endothelium. Certain of the papillae showed free hemorrhage, an occasional polymorphonuclear leukocyte and eosinophil being seen among the red blood cells. As the surface of the skin was followed, the stratum corneum was lifted away suddenly from the underlying structures. The separation occurred at the stratum granulosum, where marked papillary swelling and hemorrhage were seen. There was a scattering of eosinophils, endothelial cells and polymorphonuclears throughout the corium. The hair follicles, glands and subcutaneous structures showed nothing of interest.

Gram-Weigert stains of the skin and intestine showed gram-positive cocci in the stratum corneum of the skin. Organisms were not demonstrated deeper in the tissues.

The lesions in the skin and intestinal tract, while seen to be profound on the gross examination, showed relatively little under the microscope. Attention was directed to the similarity of the skin and intestinal pathologic changes. In the intestine the lesion was primarily in the submucosa with edema and profound congestion but associated with little cellular exudate. The mucosa was lifted from the submucosa, leaving the ulcerated surface.

The skin lesions were described in section by Winternitz,[9] Luithlen,[11] Gans [24] and others. They all spoke of the edema, the congestion, the hemorrhage, the thickening stratum corneum and the changes in the papillae, but they also described an inflammatory reaction which, while not profound in itself, is more than was demonstrated in the sections of the case reported. They further reported changes in the hair follicles which were not visible in the present case.

Bacteriology.—Surface cultures from exfoliating areas developed a variety of organisms that were considered of little significance. Smears made from the pericardial, pleural and peritoneal exudate showed a gram-negative bacillus morphologically identical with *Bacillus pyocyaneus. Bacillus pyocyaneus* were isolated in pure culture from the heart's blood at autopsy.

COMMENT

The pathogenicity of *Bacillus pyocyaneus* has long been known despite ideas often to the contrary. The organism is often found in association with other bacteria as a secondary invader after the primary causative organism has disappeared. Bacillus pyocyaneous, however, has been found capable of producing profound disease conditions at any age, producing primary local infections or generalized infections and intoxications with septicemia. In 1879, Barker [25] reported eleven cases of *B. pyocyaneus* infections found at autopsy. Five of these showed alimentary lesions with shallow ulcers and areas of necrosis; one also showed lesions of the skin resembling an exfoliative dermatitis; the other five

24. Gans, O.: Histologie der Hautkrankheiten, Berlin, Julius Springer, 1925, p. 362.

25. Barker, L. F.: The Clinical Symptoms, Bacteriologic Findings and Postmortem Appearances in Case of Infection of Human Beings with the Bacillus Pyocaneus, J. A. M. A. **29**:213 (July 31) 1897.

cases were infections of the lungs and genito-urinary tracts. All of his cases were in adults. In 1908, Baginsky [26] reported eight cases of *B. pyocyaneus* infection in children. Five of his patients had skin lesions of various types, and five had intestinal involvement with bloody dysentery. In 1908, Waite [27] gave an excellent review of the literature on *B. pyocyaneus* infections with a complete bibliography, and reported two cases of his own, one with multiple abscesses of the liver and one with an infection of the knee joint necessitating amputation. In 1910, Hazen [28] reported a case of pemphigus foliaceus with *B. pyocyaneus* isolated from the blood, urine and cutaneous surfaces. In 1914, Takahashi [29] studied a condition of the penis with profound overgrowth and ulceration resembling carcinoma. *B. pyocyaneus* was isolated from the lesion. In 1916, Freeman [30] reported a case of a patient, aged 51 years, with extensive lesions of the skin of nine months' duration, which yielded to vaccine therapy. Early in 1927, the pathogenicity of the organism was again brought to the fore by Ashby, Eldridge and Freeman [31] with a patient, aged 39 years, who showed involvement of the gastro-intestinal tract with a fatal termination. The hands and wrists were involved in an eruption, like pellagra. The large intestine showed ulceration and congestion with edema but no definite cellular reaction. Garretson and Cosgrove [32] reported an epidemic of sixteen cases of ulceration of the cornea and panophthalmitis in many due to *B. pyocyaneus* complicated by *Staphylococcus aureus* and *albus*. Jackson and Hartman [33] produced keratitis in rabbits experimentally with *B. pyocyaneus* and were able to produce immune substances in animals by injecting killed cultures and filtrates. Baginsky [26] showed the pathogenicity of his cultures for mice. Waite [27] produced immune bodies in guinea-pigs with his cultures, which were pathogenic for rats, guinea-pigs and rabbits. In many of the cases cited, the organism was isolated from the blood stream. A review of cases indicates that *B. pyocyaneus* has a predilection for the skin and alimentary tract, although it may attack any part of the body.

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26. Baginsky, A.: Centralbl. f. Bacteriol. **47**:427, 1908.
27. Waite, H. N.: J. Infect. Dis. **5**:542, 1908.
28. Hazen, H. H.: J. Cutan. Dis. **28**:118, 1910.
29. Takahashi, A.: Dermat. Ztschr. **21**:702, 1914.
30. Freeman, L.: Ann. Surg. **64**:195, 1916.
31. Ashby, W. M.; Eldridge, M. W., and Freeman, W.: Chronic Pyocyaneus Infection; Gastro-Intestinal Localization with Fatal Outcome, J. A. M. A. **88**:1307 (April 23) 1927.
32. Garretson, W. T., and Cosgrove, K. W.: Ulceration of the Cornea Due to Bacillus Pyocyaneus, J. A. M. A. **88**:700 (March 5) 1927.
33. Jackson, E., and Hartman, F. W.: J. Lab. & Clin. Med. **12**:442, 1926-1927.

SUMMARY

The case reported illustrates a typical clinical and pathologic picture of Ritter's disease as described by many others, with three additional features: 1. The hemorrhagic cyst of the suprarenal. This pathologic process is interesting in view of the changes often found in the suprarenal in serious disorders of the skin. 2. The associated ulceration of the intestine. The ulceration of the intestine has not, as far as we can learn, before been described in Ritter's disease, although it has often been associated with *B. pyocyaneus* infections. 3. The pyocyaneus septicemia. Whether the condition is due entirely to *B. pyocyaneus* or not is speculation, since on the one hand a variety of organisms have been found in Ritter's disease, and on the other hand profound lesions of the skin and alimentary tract have been associated with *B. pyocyaneus* infections.

ABSTRACT OF DISCUSSION

DR. FREDERICK D. WEIDMAN, Philadelphia: The only phase of Dr. Guy's paper that I feel qualified to discuss is that regarding the morbid anatomy in the suprarenals. There is a change known as suprarenal insufficiency which is rare in adults. When found, it usually occurs in life, particularly in the new-born. The conditions are those that Dr. Guy showed on the screen, hemorrhage in the suprarenals. The mechanism is not understood, as the children die within a few days after birth. It is supposed to be connected in some way with disturbances of respiration. There is an irregular movement of the diaphragm and the thorax in general, with a damming back of blood in the veins of the suprarenal. The suprarenal has a peculiar vascularization, and it is not difficult to explain these hemorrhagic changes on the basis of extremes of pressure, as during difficult labor. The changes in the intestine are difficult to account for on this basis. The thing we would particularly like to know in these cases of suprarenal insufficiency of the acute type is what inaugurates the changes, but this is unanswered.

DR. LLOYD W. KETRON, Baltimore: I have always felt that cases of this character are primarily due to streptococcus infection and that other organisms, such as *B. pyocyaneus*, are secondary invaders or produce a terminal infection.

The point I wish to bring out is to emphasize the importance of a correct technic in making cultures from the skin when looking for streptococci. Many stains of the organism are difficult to cultivate except in special mediums and some are easily killed by external influences, such as being diluted in salt solution before the cultures are made. After selecting the proper lesions, the material should be inoculated into the mediums as soon as possible, diluting the inoculum with broth rather than with salt solution. Blood agar plates are preferable to agar slants in test-tubes. If there are many streptococci it is easy to entirely overlook the colonies of streptococci, especially if the observer is not a trained bacteriologist. The usual method of most dermatologists, as well as other clinicians of medicine, in sending material to general laboratories for culturing in a routine way, is often productive of false information, as frequently the important organism is overlooked or not properly cultured for its demonstration.

DR. HENRY H. HAZEN, Washington, D. C.: The relationship of Ritter's disease and pemphigus foliaceus is, I think, an interesting one. I can recall one case of pemphigus foliaceus in which the clinical picture could not be distinguished from Ritter's disease, and in which postmortem examination showed not only the

hemorrhages but beginning inflammation of vessels throughout the entire intestinal tract. In thinking of *B. pyocyaneus,* it is difficult to be sure whether it is a terminal organism or whether it has toxic properties. A second case of pemphigus foliaceus was in a patient who came down from a lumber camp in West Virginia, where four cases had started at the same time. The lesions started around the mouth, like Ritter's disease and impetigo. Another patient came into the hospital with severe symptoms of pemphigus foliaceus. That case resembled Ritter's disease in many particulars, and if it had occurred in a child I would probably have diagnosed it as Ritter's disease.

I wish to point out that there is a marked similarity between certain cases of pemphigus foliaceus and Ritter's disease.

Dr. Harvey P. Towle, Boston: These cases open up a large field for discussion. We have a process reputed to be bacterial, visibly affecting the skin, and at necropsy find it has affected the internal organs. That suggests a septicemia. On that ground we have to argue for a process which will involve the skin and internal organs without an appreciable rise in temperature or other symptoms of septicemia. In two cases which corresponded in every way with the one shown by Dr. Guy, we did tests of every sort. One child in particular had a —18 metabolic test. One had a rapidly spreading exudative dermatitis, such as occurred in Dr. Guy's case. We tried thyroid medication, after several other things, and the child made a rapid and complete recovery. That brings up the question of the vegetative nervous system. You notice they found disturbances in the suprarenal glands. I think that the whole thing should be discussed from the endocrine standpoint as well as the bacterial. These infections are common in all diseases, and I think do not explain the whole thing.

Dr. Walter J. Highman, New York: Dr. Guy's paper seemed in itself complete and perfectly reasonable, and did not make extraneous claims under his title. But the discussion has confused me, and with the idea of asking Dr. Guy to clear up this confusion I should like to ask him whether he thinks there is any relation between Ritter's disease and pemphigus or dermatitis exfoliativa. The question of pemphigus has been violently injected into our deliberations. I do not know by what definition Dr. Hazen's group was identified as pemphigus foliaceus. It sounds to me like acute dermatitis exfoliativa. To call such a condition pemphigus foliaceus simply increases the nosologic confusion covering the subject. The question of *B. pyocyaneus* was not mentioned by Dr. Guy in an etiologic sense. It has been interpolated into the discussion, it seems to me, gratuitously. There is no reason, because at autopsy we find various micro-organisms, to consider them part of the original picture. The presenter of the paper kept clear of this sort of thing. I would like to know whether he considered Ritter's disease a form of dermatitis exfoliativa or pemphigus foliaceus, and whether he thinks there is a causal relationship between the organisms he mentioned and the disease.

Dr. William H. Guy, Pittsburgh: In answering some of the points that have been raised, I would utilize the answer of Ritter to Behrend's suggestion that dermatitis exfoliativa neonatorum and pemphigus foliaceus were but variants of the same process. Pemphigus foliaceus is universally fatal, and regeneration of epithelium does not occur. The age of the patients, the rapidity of advance of the disease, the primary erythema followed by exfoliation of great sheets of the epidermis are all diagnostic points in contrast to pemphigus foliaceus. Ritter pointed out that the disease might in the beginning simulate a miliaria, a bullous impetigo, an exudative dermatitis, etc., but that within a few hours the typical erythema and exfoliation ensued and the original picture was entirely lost. As to etiology,

numerous investigations have been made and, as noted, widely divergent opinions have been expressed. Many bacteria have been demonstrated, but these have usually been obtained from surfaces of the skin; to assign etiologic significance to such observations, it seems to me, would be unjustifiable. All open surfaces, inflamed or otherwise, yield a variety of organisms. Ritter's disease has frequently been classed with bullous impetigo, but critical examination of the case in point indicates that these authors were not dealing with typical examples of Ritter's disease. I feel very strongly that this condition is a clinical and histologic entity. The process is primarily a congestive one with marked edema and vascular dilatation lifting off the epithelium. The rôle of *B. pyocyaneus* in the case reported cannot be definitely assigned, because while this organism has been shown capable of producing such pathologic changes, in proved cases of Ritter's disease a variety of organisms have been demonstrated. Acute suprarenal insufficiency must be considered in view of the pathologic condition in this particular case. I would suggest that Ritter's disease, while a clinical and histologic entity, is capable of being produced by more than one cause.

THE HINTON GLYCEROL-CHOLESTEROL PRECIPITATION REACTION IN SYPHILIS*

C. MORTON SMITH, M.D.
BOSTON

The laboratory tests on which this paper is based were the Wassermann, the Kahn and the glycerol-cholesterol precipitation.

The technic for the Wassermann test is that published by Hinton.[1] Two antigens were used separately: one, a simple, cholesterolized, alcoholic extract of the heart of a guinea-pig and the other, an alcoholic extract of the heart of a human being half saturated with cholesterol at 17 C. The hemolytic system consisted of 2 units of amboceptor, 2 units of complement and 0.5 cc of a 5 per cent suspension of sheep's corpuscles. One-tenth cubic centimeter of serum was used for each antigen, and 0.2 cc. for the anticomplimentary control. The primary incubation was for forty minutes at 37 C. and the secondary incubation for one hour at the same temperature. Tests were read immediately after the secondary incubation. The results were reported as positive, negative and doubtful.

The Kahn reaction was performed as described by Kahn.[2] The antigen was prepared from ground, dry beef heart tissue. It was prepared according to the method originally described by Neymann and Gager, which is used by Kahn. It consists essentially of the ether-insoluble, alcohol-soluble fraction of dried beef heart, to which cholesterol is added so that the resulting solution contains 0.6 per cent of cholesterol. The antigen was titrated in accordance with the directions by Kahn. Five-hundredths cubic centimeter, 0.025 cc. and 0.0125 cc. of the freshly diluted antigen were pipetted into each of three tubes, and then 0.15 cc. of serum was added to each of the tubes. The rack containing the tubes was next thoroughly shaken for three minutes, and the results read immediately. The tests were reported as positive if one or more of the tubes showed a distinct precipitate, doubtful if there was no definite precipitate in any of the tubes but a questionable precipitate in any or all of the tubes, and negative when no precipitate occurred in any of the three tubes.

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* Submitted for publication, July 14, 1928.

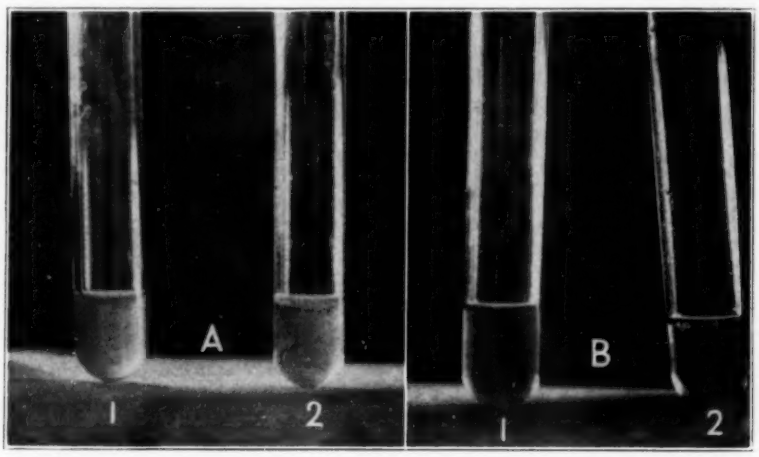
* Read at the Fifty-First Annual Meeting of the American Dermatological Association, Washington, D. C., April 30, 1928.

1. Hinton, William A.: A Standardized Method of Performing the Wassermann Reaction, Am. J. Syph. **4**:155 (Oct.) 1920.

2. Kahn, R. L.: Serum Diagnosis of Syphilis by Precipitation, Baltimore, Williams & Wilkins Company, 1925.

The glycerol-cholesterol precipitation reaction, which Hinton believes is, in reality, not a precipitation test but an agglutination reaction, was executed as described in a previous article,[3] with the following modifications: (1) The temperature of incubation was 37 C. rather than 27; (2) the amounts of serum used were 0.1, 0.2, 0.3, 0.4 and 0.5 cc., and (3) the salt concentration varied in proportion to the amount of serum used. Five per cent salt was used for diluting the stock indicator in the 0.1 and 0.2 cc. amounts of serum, 3 per cent salt was used in the 0.3 and 0.4 cc. amounts, and 2 per cent salt in the 0.5 cc. amount.

The stock indicator used by Hinton consisted of the ether-insoluble, alcohol-soluble fraction of beefsteak muscle, which he added to a 0.7 per cent solution of cholesterol in absolute alcohol, in the proportion of



A indicates results for Kahn test and *B* those for Hinton test; 1 and 2 indicate negative and positive reactions, respectively.

one part of the extract to nine parts of the cholesterol solution. Portions of this stock indicator sufficient for the day's test were diluted with the 2, 3 and 5 per cent salt solution in the proportion of one part of the stock indicator to two parts of salt solution, shaken vigorously for from two to three minutes, then twelve parts of the salt solution added to each and again shaken, and finally fifteen parts of 50 per cent glycerol in distilled water added to each and shaken. The indicator prepared in this way was next added to the designated amounts of serum. The incubation was for a period of sixteen hours, at the end of which time the tests were read. A slight clearing, which sometimes occurred in any or all the tubes, was regarded as negative. Positive reactions were reported

3. Hinton, William A.: A Glycerol-Cholesterol Precipitation Reaction in Syphilis, Boston M. & S. J. **196**:993 (June 16) 1927.

when any or all of the tubes showed complete clearing of the suspension, with a resulting water-clear fluid in which large flocculi, consisting of the agglutinated particles of cholesterol, were suspended. When flocculi were not present, the test was reported as negative.

In June, 1927, Hinton [3] published the technic of his glycerol-cholesterol precipitation test for syphilis.

Recognized shortcomings in results of Wassermann reactions, together with the expense, caused various workers to seek more accurate results by shorter and less complicated methods.

As early as 1909, optical demonstration of the difference between normal and syphilitic serum was made by Jakobsthal. Since that time, various precipitation or agglutination tests for demonstrating syphilis in serum reactions have been proposed. Meinecke, Sachs and Georgi, and others abroad, and Kahn in this country have been closely identified with this work. All of these precipitation tests depend on the ability of syphilitic serum to precipitate an "undetermined lipoidal complex."

Hinton found that Wassermann-positive serums would completely precipitate, or serologically speaking, agglutinate a suspension of cholesterol in a glycerinated hypertonic solution of sodium chloride containing the merest trace of beef muscle extract, and would leave a water clear fluid containing distinct masses of cholesterol, while Wassermann-negative serums would leave the suspension visibly unchanged (evenly turbid), or at most with such finely divided flakes that the fluid appears turbid.

The addition of glycerol evidently contributes to the agglutinating effect, resulting, in the case of Wassermann-positive serums, in the formation of large aggregates of cholesterol, with a consequent complete clearing of the fluid. It was further found that glycerol protected the cholesterol suspension against adventitious agents which otherwise would disturb its equilibrium unfavorably. This protection has made it possible to prepare a suspension containing all of the ingredients ready for use which, when properly made, has kept unimpaired for six weeks. Hinton also found that this addition of glycerol made it possible to use with advantage a smaller amount of the alcoholic muscle extract than was required in the previously described methods and still be able to use the maximum amount of cholesterol.

From his experience with the Kahn, the Bruck, the Meinecke, and the slide test of Kline and Young, he finds that his test is more sensitive than the others, and that it has not given as many false positive reactions as have occurred in his use of the Kahn and Wassermann technic.

He concludes his paper as follows: "A simple, easily read, sensitive serum test for syphilis has been described, apparently possessing greater clinical value and requiring less labor, apparatus and materials than the Bordet-Wassermann reaction."

COMPARATIVE RESULTS

This report compares results obtained by Wassermann and Hinton reactions, and in a smaller group a Kahn test was also done. The review includes figures from the Massachusetts General Hospital, Boston Dispensary, Psychopathic Hospital, Medical Clinic of the Peter Bent Brigham Hospital, Walter E. Fernald School at Waverly, Boston Lying In Hospital and a group of private patients. The psychopathic group is the only one made up entirely of syphilitic patients, and in the pregnancy group none of the patients had syphilis. All stages of the disease, from early primary to late neurosyphilis, are included, and most of the patients had received more or less treatment.

A comparison of result of Wassermann and Hinton reactions in 260 specimens of blood from 243 unselected cases in private practice was

TABLE 1.—*Comparison of Result of Wassermann and Hinton Reactions*

Wassermann and Hinton tests agreed in 192 cases,	73.84 per cent
Positive with both reactions in 42 tests, or	21.82 per cent
Wassermann was stronger than Hinton	10
Hinton stronger than Wassermann	49
Wassermann doubtful	15
Hinton doubtful	13

TABLE 2.—*Results of Tests in Early and Late Cases of Syphilis*

		Wassermann			Hinton		
Stage	Number	Positive	Doubtful	Negative	Positive	Doubtful	Negative
Primary and secondary	11	10	0	1	10	0	1
Late	77	26	9	42	47	4	26
Early treated	93	6	2	84	13	3	77
Neurosyphilis	7	0	0	7	1	1	5
Congenital	4	0	2	2	2	1	1
No history	51	1	1	49	3	3	45

made. Two hundred and six of the patients have or have had syphilis. A large proportion are late cases in which the patients have received much treatment. There were fifty-one patients without history or clinical evidence of syphilis.

In both the Wassermann and the Hinton tests there were two cases (not the same ones) in which the results were recorded as unsatisfactory. Hemolysis was given as the cause in the cases in which the Wassermann test was unsatisfactory, but an explanation was not given for the two cases in which the results with the Hinton test were unsatisfactory.

If these cases are divided into two groups, primary and early secondary in one, and late latent and cases in which treatment has been given in the other, there is entire agreement in results in the first group.

Of the 260 specimens of blood from private patients, a Wassermann, Hinton and Kahn test was done on 176.

In this group, from a serologic standpoint, the Hinton test missed eleven cases—all cases of old syphilis. Some of these reactions were in the early days of the test and were undoubtedly technical errors. There were three "doubtful" reactions reported in cases in which the patients did not show any clinical evidence of syphilis. There was apparently one false positive Wassermann and Kahn reaction. Kahn missed fourteen and Wassermann missed twenty-four cases detected by one or both the other tests.

In 176 cases a Hinton and Kahn test was done. One hundred and thirty-one agreed, or 74.43 per cent.

In this same group, there were: 17.61 per cent Wassermann positive; 40.34 per cent Hinton positive, and 24.43 per cent Kahn positive reactions.

In cases of early syphilis, the results of these three tests are practically the same. The superiority of the Hinton test over the others is in the group of treated patients with late, latent and neurosyphilis.

TABLE 3.—*Results of Wassermann, Hinton and Kahn Tests in 176 Cases*

All tests agreed	116 cases
All tests positive	23 cases
Wassermann stronger than Kahn or Hinton	4 cases
Hinton stronger than Wassermann or Kahn	15 cases
Kahn stronger than Wassermann or Hinton	9 cases
All three tests negative	93 cases
65.9 per cent agreement	
Wassermann doubtful	7
Hinton doubtful	11
Kahn doubtful	10

Hinton believes the test capable of detecting syphilis in blood serum no matter in what tissues the activity of the disease may be located, even the central nervous system. At present he thinks this ability is developed to about 98 per cent.

In 195 cases of pregnancy from the Boston Lying In Hospital there were no positive reactions of the blood by either the Wassermann or the Hinton tests. This is in entire accord with the history and clinical observations.

From the Massachusetts General Hospital, I have the reports on 1,759 routine cases, more than half of which are from the Syphilis Out Patient Service. The results are shown in table 4.

There were two cases in section 2 A missed by the Hinton reaction, and three others in which the clinical picture was slightly suggestive of syphilis. The remaining twenty-seven cases evidently gave false positive Wassermann reactions, as evidence of syphilis was lacking in the history or physical examination. Section 2 B is made up largely of cases of syphilis in which the patients were treated. The records were carefully looked up, and in six cases there was no clinical or historical evidence of

syphilis. The condition in these six cases was as follows: psoriasis; toxic adenoma of the thyroid with history of malaria twenty-eight years previously; abscess of the lung with spirochetes in the sputum; streptococcus hemolyticus septicemia; rheumatic heart disease with history of malaria five months previously, and carcinoma of the rectum with metastases and bronchopneumonia.

Since April 2, 1928, the Hinton test has displaced the Wassermann reaction as the routine serum test for syphilis at the Massachusetts General Hospital, because of simpler technic and more accurate results at a lower cost.

Cases from the Peter Bent Brigham Hospital.—There were 2,120 patients in the medical clinic of the Peter Bent Brigham Hospital from

TABLE 4.—*Results of Wassermann and Hinton Tests in 1,759 Cases*

1. Cases in which the tests agree		
A. Both tests strongly positive	392	
B. Both tests weakly positive	51	
C. Both tests negative	919	
D. Wassermann stronger than Hinton	13	
E. Hinton stronger than Wassermann	37	
Total		1,412 or 80.2 per cent
2. Cases in which the tests disagree		
A. Wassermann positive, Hinton negative	32	
B. Hinton positive, Wassermann negative	230	
Total		262 or 14.9 per cent
3. Remaining cases		
A. One test negative; the other questionably positive	48	
B. Wassermann anticomplementary; Hinton positive	7	
C. Wassermann anticomplementary; Hinton negative	30	
Total		85 or 4.8 per cent
Grand total	1,759	

whom 2,331 specimens of blood were examined. Of these cases, there were 215 syphilitic patients, 148 of whom showed positive Wassermann reactions and 183 of whom showed positive Hinton reactions. There were seven false positive reactions to the Hinton test, as follows: two in meningitis, two in mild diabetes and one in fatal pneumococcus septicemia; the others were not listed. No false positive reactions were obtained in cases of acute diseases of the respiratory tract or pernicious anemia.

There were thirteen false positive Wassermann reactions and twenty-eight false weakly positive Wassermann reactions, as follows: in three cases of asthma, during acute stages; in one case of pneumonia; in three cases of acute infections of the upper respiratory tract; in one case of abscess of the lung; in one case of bronchiectasis, and in one case of pulmonary tuberculosis. Only one false positive reaction was obtained in jaundice and two in diabetes. The false weakly positive reactions were not listed.

Boston Dispensary Group.—A study was made of 1,610 patients. There were 2,026 examinations of blood by the Wassermann, Kahn and Hinton technic, with the results as shown in table 5.

Psychopathic Hospital Group.—There were 118 patients, all with syphilis of the central nervous system, from whom 665 specimens of blood were obtained. These patients were all receiving vigorous antisyphilitic treatment. Table 6 shows the results of the Wassermann, Hinton and Kahn tests.

TABLE 5.—*Results of Tests in 2,026 Examinations of the Blood*

	Number of Patients	Number of Examinations
Group 1. Syphilis	433	760
A. All tests positive	126	168
B. All tests negative	108	137
C. Discrepant tests	199	455
Group 2. Nonsyphilis		
A. All tests negative	1,110	1,127
B. Discrepant tests	55	103
Group 3. ? Syphilis		
A. All tests negative	6	12
B. Discrepant tests	6	24

	Positive	Negative	Doubtful	Omitted	Total
Group 4. Analysis of discrepant tests from group 1, clinical sphilis, 199 patients with 455 examinations					
Wassermann	189	186	80	0	455
Kahn	131	272	41	11	455
Hinton	342	111	0	2	455
Group 5. Analysis of discrepant tests from group 2, nonsyphilis, 55 patients with 103 examinations					
Wassermann	7	53	42	1	103
Kahn	2	93	4	4	103
Hinton	2	100	0	1	103

TABLE 6.—*Results of Tests in 665 Specimens of Blood*

	Wassermann	Kahn	Hinton
Positive	268	354	555
Negative	323	141	67
Doubtful	65	116	38
Insufficient	9	54	5
	665	665	665

Of these 118 patients, sixteen were cases of tabes dorsalis in which the reaction of the blood or spinal fluid, or both, had previously been positive. Seven had positive reactions of the spinal fluid during the time in which these comparative tests were made, and nine had negative reactions of the spinal fluid during the same time.

There were sixty-two cases of paresis; from these cases 306 specimens of blood were obtained. The results are given in table 8.

From the Walter E. Fernald School (state school for feebleminded) at Waverly, I am permitted to quote the results of blood tests which are part of a study that is being carried on at this time. Blood from 1,350

patients was tested by the Wassermann, Kahn and Hinton technic. Eighteen gave a positive reaction by all three methods. In addition to these, twenty-one patients gave a positive reaction only with the Hinton method. None of these tests were recognized as false positive by the clinicians. The employment of serologic examinations in this study was for completeness and was not intended to show syphilis as an etiologic factor in feeblemindedness.

This paper is, in a way, a preliminary report, and there may be defects or advantages in the test not yet recognized. For the clinician, it offers a positive serum diagnosis as early in primary syphilis as does the Wassermann test, but should not in any way discourage the prompt use

TABLE 7.—*Results of Tests in Cases of Tabes Dorsalis*

	Wassermann	Kahn	Hinton
Tabes—(Seven Cases with Positive Reactions of the Spinal Fluid) 29 Tests			
Positive	9	9	15
Negative	19	9	11
Doubtful	1	9	3
Insufficient	0	2	0
	29	29	29
Tabe—(Nine Cases with Negative Reactions of the Spinal Fluid) 41 Tests			
Positive	9	18	31
Negative	30	14	9
Doubtful	2	5	0
Insufficient	0	4	1
	41	41	41

TABLE 8.—*Results of Tests in Cases of Paresis*

	Wassermann	Kahn	Hinton
Positive	152	169	278
Negative	108	52	13
Doubtful	41	57	13
Insufficient	5	28	2
	306	306	306

of the microscope or dark-field examination in all cases of possible primary syphilis. The test definitely raises the height of the therapeutic hurdle, as it requires much more intensive and persistent treatment to obtain and retain a negative Hinton reaction than a negative Wassermann reaction.

For a year, a Hinton reaction and, in several instances, a Kahn test in addition to the Wassermann was done on many of my patients. In the early secondary cases in which the patients were not treated, there is a close agreement in results; the striking variation is found in the late cases of syphilis in which the patients were treated. Included in this study are many patients who have received little if any treatment for years, and several with negative tests who have never received arsphenamine.

SUMMARY

1. As a rule, the Hinton reaction gives a smaller number of so-called "doubtful" readings.

2. It is claimed also that the reaction becomes positive earlier than does the Wassermann, and at least as soon as the Kahn.

3. The incidence of false positive reactions is reduced.

4. There are few conditions, thus far recognized, that give false positive reactions.

5. Another point in favor of the Hinton test is that it is possible to work with anticomplementary and somewhat hemolyzed blood. This fact is often of great value to the clinician.

6. It requires far less training to be able to read results of the Hinton test than those of either the Kahn or the Wassermann.

7. It is applicable to spinal fluid as well as blood serum.

8. It is apparently more nearly a specific test for syphilis than the others.

ABSTRACT OF DISCUSSION

DR. ARTHUR W. STILLIANS, Chicago: I wish to express my appreciation of this paper and to add my experience concerning the ease of using this glycerol reaction. In my report on syphilis in pregnancy last year, I read the results in 7,768 cases, and while our results were not nearly so good as those in the report Dr. Smith has given, we did appreciate the ease of using this reaction.

DR. JOHN H. STOKES, Philadelphia: One of Dr. Smith's points deserves vigorous emphasis. It is extremely important not to base final conclusions on the worth of diagnostic tests on mere comparisons by two contrasted laboratory methods. The final appeal must be to the clinical observations. The effort to displace a much studied method like the complement-fixation test for syphilis, by a precipitation test which has had relatively little clinical evaluation, is to be regretted and deprecated, and I believe this realization is beginning to come home to certain laboratories which perhaps a little too hastily gave up the one procedure for the other. In the study of precipitation tests we are certain to meet the same problem to which Dr. Mitchell has called our attention in the complement-fixation tests; namely, that weak and partially positive reactions will be misused by being made the basis for the diagnosis of syphilis unsupported by other clinical or serologic evidence. It is, I think, generally true that the so-called simplified procedures turn out to be much more difficult in actual performance than their advocates realize at the outset. Their factors of error can and should be studied in the clinic and not exclusively by laboratory men engaged in test tube comparisons of one method with another.

DR. HARVEY P. TOWLE, Boston: The Wassermann test and its various modifications are admittedly nonspecific, that is to say they will react to conditions, chemical or biochemical, which have nothing to do with syphilis. Continually, new modifications of the test technic are appearing. Continually, the percentage of so-called "positive reactions" is rising. If progress continues, logically, the positive results should reach 100 per cent eventually. Will any one claim that 100 per cent results with the test represents 100 per cent syphilis? If not, where shall one begin to draw the line between true and false results? Is it not possible that the

test detects a stale or systemic condition, a diathesis if you wish, rather than an actual disease? That being so, as Dr. Stokes has already said so well, we cannot rely on the tests alone but must have supporting evidence. In the early days of the serum tests, we insisted that confirmatory evidence was a necessity. Of late we would seem to have forgotten that necessity.

Dr. C. Morton Smith, Boston: I quoted my own figures rather than those of the various hospitals because I knew intimately the patients whose cases are reported. I agree heartily with Drs. Stokes and Towle that the laboratory should be used as an aid and not as the sole source of diagnosis. One of the chief advantages in the Hinton test is the ease with which it can be read. I think it is the consensus of opinion that one of the difficulties in the Kahn test is the difficulty of reading the positive reactions.

ANTOINE DEIDIER

A PRECURSOR OF SCHAUDINN AND HOFFMANN *

B. BARKER BEESON, M.D.
CHICAGO

In 1723, Antoine Deidier, a physician of Montpellier, France, published a work dealing with syphilis, including under that same heading, as was then the custom, gonorrhea and chancroid. It is known that the etiology of syphilis was, at that time, in a most confused state. A favorite theory stated that the syphilitic virus was a sort of corrosive acid which devoured the solid structures of the body and coagulated the humors, much as did vitriol. From his knowledge of chemistry, of which he was professor at Montpellier, Deidier concluded that this idea was erroneous, since the acids have a rapid action on the tissues and do not possess an incubation period as is the case in syphilis. He, therefore, set out to refute this theory and to substitute for it a more plausible one. In his opinion the syphilitic virus was composed of tiny worms, which produced eggs by coupling, and multiplied as do insects. Deidier also believed that these worms produced an obstruction in the parts where they lodged and deposited their eggs. Thus, if they were deposited in the urethra, they caused gonorrhea; if they attached themselves to the genitalia, they produced chancres and excrescences appeared on those parts, while if these venereal worms reached the inguinal glands buboes occurred.

The effect of the syphilitic virus varied, since some men having relations with infected women did not contract the disease, either because of an insufficient amount of virus or because of resistance on the part of their constitutions. Deidier's theory as to these venereal worms was largely based on his knowledge of insect life, but apparently the chief argument in its favor was the efficient action of mercury in the treatment of patients with syphilis. He believed that this drug destroyed the worms. Deidier stated that a favorable response to mercurial treatment, in a given case, pointed to syphilis as a probable cause.

As might be expected, Deidier's theory as to the etiology of syphilis fell on barren soil, being almost entirely ignored. Astruc,[1] one of the leading venereologists of that period, saw fit to attack it as being fallacious and without foundation. He wrote as follows:

> I shall not stop to refute the ideas of those who believe that the venereal virus is nothing more than a number of very small, very agile and very prolific animals, which, having entered the body, rapidly multiply and pass frequently to distant

* Submitted for publication, Sept. 17, 1928.

1. Astruc, M.: Traité des maladies vénériennes, ed. 4, Paris, 1777, vol. 2, p. 30.

parts which they attack and cause to become inflamed and ulcerated, and thus in the absence of any alteration of the humors, produce all the symptoms of syphilis.

Such an opinion shows how firmly anchored were the Galenic humoral ideas even as late as 1777.

Dr. Ménétrier, professor of the history of medicine and surgery of the faculty of medicine of the University of Paris, presented a paper on Deidier and the venereal worms at the 1925 International Congress of the History of Medicine held at Geneva. He referred to them as the veritable ancestors of *Spirochaeta pallida,* and thus resurrected a theory which almost two hundred years after its inception was shown to be correct.

Pierre Cougnot [2] devoted his inaugural thesis to this same subject.

CONCLUSIONS

Deidier was one of the first, if not the first, to suspect the real cause of syphilis.

He would appear to have had a knowledge of immunity.

His idea that improvement under the administration of mercury might indicate the presence of syphilis corresponds to what is known as the therapeutic test.

He is entitled to wider recognition as a pioneer in syphilology.

55 East Washington Street.

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2. Cougnot, Pierre: Deidier. Les vers vénériens, Thèse de Paris, 1926. I am indebted to this work for most of the facts about Deidier's theory.

TREATMENT FOR PEMPHIGUS

A FURTHER REPORT *

ROBERT H. DAVIS, M.D.
ST. LOUIS

Five years have passed since the method of treatment for pemphigus by the administration of iron cacodylate intravenously and coagulin subcutaneously was suggested to the American Dermatological Association. It is believed that a brief report embodying the present condition in the cases then reported, the addition of seven more to the list, and some comments on the lessons learned by the experience acquired in that time would be of interest.

The late Dr. G. W. Wende [1] reported a series of ten cases in which this treatment was used, with clinical cure in five, improvement in three, no improvement in one and death in one.

In a discussion at the meeting of the American Dermatological Association in 1926, Guy [2] reported that he had had ten patients with pemphigus vulgaris, all treated with this method, and that all had died.

Wise,[3] commenting on the marked variation in results in the cases reported by Dr. Wende, by the late Dr. W. D. Davis and myself, and by others, suggested that the reason may be that an incorrect diagnosis of pemphigus was made. I cannot agree with this suggestion. The cases reported by Dr. W. D. Davis and myself were undoubtedly cases of pemphigus, and those reported by Dr. Wende would certainly appear to be so also. It is true that in a number of cases the condition was diagnosed differently at the beginning, but the course of the malady in each instance revealed its true character within a few weeks at the longest. I should suggest that the type, duration and previous behavior of the disease, and the habits and history of the patient are the more important factors.

Grindon,[4] having met with disappointing results with the method in a severe case, reported a gratifying outcome with the use of tryparsamide intravenously. He [5] also used this treatment in another case with

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* Submitted for publication, July 14, 1928.

* Read at the Fifty-First Annual Meeting of the American Dermatological Association, Washington, D. C., May 2, 1928.

1. Wende, G. W.: Pemphigus: Experience with Davis Treatment, Arch. Dermat. & Syph. **11**:783 (June) 1925.

2. Guy, W.: Personal communication to the author.

3. Wise, Fred: Progress in Treatment of Skin Diseases, J. A. M. A. **86**: 1409 (May 8) 1926.

4. Grindon, Joseph: Med. Clin. North America **11**:507 (Sept.) 1927.

5. Grindon, Joseph: Personal communication to the author.

equally favorable results. I have tried it in one of my cases which will be commented on later.

As regards the cases reported in 1923, I have been unable to trace the patient in case 1 after the first year. The patient in case 2 remained well for three years after her discharge, then remarried, and her new name was unobtainable. The patient in case 3 has remained well up to the present time. In cases 4 and 6, the two postvaccinal ones, the patients were improved but not clinically cured at the time of the previous report. They slowly recovered, but had several minor relapses in the six to nine months after discharge from the hospital, and were treated at the clinic with the remedies previously used, and finally with solution of potassium arsenite for from one to two months after apparent cure. These patients have remained clinically well for three years. Sodium arsenate solution 2 per cent and phenol 2 per cent in distilled water was used hypodermically in from 0.5 to 1 cc. doses in both of these cases instead of the iron cacodylate, and this remedy had a satisfactory, though possibly not so powerful, action. It was impossible for me to enter the small veins after numerous punctures extending over many months. Thromboplastin was also tried as a substitute for coagulin in each case at the same period, but the occurrence of a severe relapse in each in a week caused me to return to the first remedy. In case 5, the patient died. The death was reported in the first paper. In case 7, the patient is still well, and has not had a relapse in five years.

REPORT OF CASES

CASE 1.—*History.*—E. J., a white girl, aged 10, an American, was seen on Jan. 9, 1924, with symptoms of an erythematobullous eruption on the right knee, right leg, right thigh, left forearm and both wrists. The disease had begun with an infection on the right knee following a superficial injury four days earlier. The diagnosis was septic pemphigus. The diagnosis, at first, had been impetigo contagiosa, by an attending physician, and strong local applications had been used. The condition had become rapidly worse in the next fifteen hours. Her body and limbs showed many bullae, breaking easily and drying to form crusts, from beneath which the exudate issued. The temperature was 99 F. and the pulse rate, 85. Injections of sodium arsenate solution and coagulin were at once begun. Five drops of sodium arsenate solution and 1.5 cc. of coagulin were used.

Course.—The patient failed steadily for several days. The pulse rate went to 140, and the temperature to 100 F. by the fourth day. An internist, who was called in, gave a bad prognosis, but ordered one digitan tablet daily. Administrations of sodium bromide for restlessness and insomnia were begun, with later disastrous results. The condition of the eruption and the accompanying foul odor continued the same, though the temperature returned to normal and the pulse rate dropped to 90 in a few days. By this time the increasing restlessness and nervousness had to be controlled with the use of morphine and the dosage of sodium arsenate solution had been gradually raised to nine drops at each injection.

The foul odor from the necrotic skin in the popliteal and cubital regions was almost overpowering to the patient and attendants. The urine at this time did not

show albumin, but multiple granular casts, an unusual phenomenon not observed in my other cases. The dosage of sodium arsenate solution was reduced to six drops. In three days, the urine became much better. The pulse rate was 120 and the temperature 100 F. By January 19, the condition was improving. Injections of coagulin were continued on alternate days with injections of the sodium arsenate solution. The impression at this time was that the urine was as bad after either injection and possibly was independent of either. The injections of sodium arsenate solution were stopped on January 21. The patient had been on a nonprotein diet since January 20. The urine was in a much better state, but some casts were still present. The pulse rate was 104 and the temperature 94 F. on January 23. On January 24, the administration of sodium arsenate solution was recommenced (a dose consisted of 4 drops). If more than 4 drops of the sodium arsenate solution were given, the casts would reappear. I was able to establish a definite maximum dose in this case. On January 29, the use of bromide was stopped, as some flare-up of lesions and exudation occurred, probably due to the use of bromide. By January 31, a definite and continuous improvement began. The doses of sodium arsenate solution were stopped on February 19, and the use of coagulin continued until March 9. The pemphigus lesions and crusts had disappeared by March 3. A course of sodium arsenate solution was given every third day for six injections, commencing March 15, then coagulin every third day, from March 31 to April 10. The patient was then discharged. She was clinically cured, and there was no recurrence in four years.

CASE 2.—*History.*—J. R., a white man, aged 61, an American, had been an alcoholic addict for years. The diagnosis of pemphigus vulgaris was made. The duration was four months. He entered the Barnard Skin and Cancer Hospital, in the service of Dr. Engman and Dr. Mook, on Aug. 14, 1924, with a general bullous eruption on the body, arms and legs. The results of the physical examination and the examination of the blood were negative, except for a left inguinal hernia. Treatment with sodium arsenate solution was begun at once. By a mistake of the pharmacist or intern, sodium arsenite was given instead of sodium arsenate solution for two weeks. After that time, the use of sodium arsenate solution was begun, 8 drop doses being administered every three days. This was too small a dose, as I have found out since. At this time, the white blood cells numbered 7,600, and the differential count showed nothing.

Course.—In ten days, the dose had been gradually increased to 1 cc. On September 9, the administration of coagulin was begun. The doses of sodium arsenate solution were stopped after one month. The administration of coagulin was continued three weeks longer. The patient did not show any special improvement, and gradually grew weaker. Administrations of strychnine, 1/30 grain (0.002 Gm.), three times a day, and iron cacodylate were tried intravenously three times a week for one week without effect, then doses of iron cacodylate alone were begun for the first time. By November 5, the use of coagulin was recommenced. On November 18, antistaphylococcus vaccine was given in a dose of 100,000,000 bacteria, intravenously. There was no lasting effect, and the patient gradually grew worse. The doses of iron cacodylate were stopped on November 18, for two weeks. They were again given from December 4 to December 12. At this time, the number of white blood cells was 17,200, and the differential count still showed nothing. The patient developed pneumonia on December 14, and died on December 16. This was the second fatal case, and was one in which the patient never showed any special improvement.

CASE 3.—*History.*—J. H., a white man, aged 59, a salesman, an American, came to the office on Oct. 29, 1924, with a lesion resembling impetigo contagiosa on the

left side of the neck, and a history of trauma one month before. Treatment was begun for impetigo. In ten days, the case became clearly one of pemphigus and injections of sodium arsenate solution and coagulin were begun. After two weeks, he disappeared from observation as he had intercurrent grip. He reappeared and entered the Barnard Skin and Cancer Hospital on Feb. 3, 1925.

Examination.—There was a universal bullous and crusted eruption on the skin, and there were a few lesions on the buccal mucosa. The white blood count was 12,200, and the eosinophilia, 28 per cent. During the next six weeks, he was given three transfusions with whole blood, which resulted in only temporary improvement after each transfusion; then he was given one injection of 25 cc. of 1 per cent gentian violet solution (in physiologic solution of sodium chloride) intravenously, without effect. He became progressively worse, with a general eruption and extensive lesions of the mucous membranes. He was thought to be almost moribund.

Course.—On March 19, the number of white blood cells was 11,000 and the eosinophilia was markedly reduced. Injections of iron cacodylate and coagulin were begun on March 26, and were given daily for one week; then alternate days for one month. He improved steadily, and left the hospital, on June 25, in good condition, but not entirely well. He remained in about the same condition, that is, he had mild exacerbations at times; for six months, he returned to the clinic for treatment when these exacerbations occurred. Since February, 1926, he has been treated at intervals at the office with from two to six months' intermissions. He is able to work steadily, and, at the time of writing, had not been back for treatment for six months.

Case 4.—*History.*—M. R., a Jewish woman, aged 43, had had a disease diagnosed pemphigus, of several years' duration, during which time she had had intermittent attacks, often of great severity. At the time of examination the diagnosis was pemphigus vulgaris. On admittance to the Barnard Skin and Cancer Hospital, service of Dr. Engman and Dr. Mook, on May 5, 1925, there was a general severe bullous eruption of the skin, lips, buccal mucosa, tongue, throat, anterior pillars of fauces and the perianal region.

Course.—The white blood cells numbered 15,000, and the eosinophilia was 6 per cent. The patient was given injections of iron cacodylate and coagulin on alternate days. She showed no change in one month. The injections of iron cacodylate were then stopped and doses of sodium arsenate were begun. In six weeks, vegetations appeared in the groins. The doses of sodium arsenate solution were then stopped. There was frequent vomiting with expulsion of epithelial masses or sheets in the vomitus and per rectum, indicating, I believed, that the lesions had invaded the upper and lower gastro-intestinal tract. The condition at this time was most desperate. A slippery elm emulsion, made with glycerin and water, gave most local relief in the mouth, and phenobarbital in from 1.5 to 2 grain (0.09 to 0.13 Gm.) doses night and morning acted best as a sedative. The injections of sodium arsenate solution were resumed after ten days. Four days later a sudden laryngeal involvement threatened immediate death. The patient rallied, however, and after one week, a severe abdominal attack, never diagnosed, occurred, with pain in the region of the gallbladder; there was leukocytosis, the white cell count being 18,000. This condition passed in three hours, leaving her in fair condition. Nothing abnormal was found on physical examination. Now, for the first time, the patient showed a definite improvement, despite the spread of vegetations to the axillae and a rise in temperature to 102 F. At this time, x-ray irradiation was tried on the vegetations, without success. There was a relapse in ten days which lasted three weeks. Then the doses of sodium arsenate

solution were stopped. Marked improvement occurred again, lasting three weeks. The temperature returned to normal, the vegetations disappeared, and the gastrointestinal symptoms diminished markedly. The injections of sodium arsenate solution and coagulin were resumed after three weeks. The number of white blood cells was 15,000 and the eosinophilia, 3 per cent. There was a great increase in the skin lesions, however, especially on the back and arms, until these became largely denuded. The patient died suddenly on Oct. 18, 1925, in sleep, without any unusual premonitory symptoms. An autopsy was refused.

CASE 5.—*History.*—A. B., a white woman, aged 50, an American, came to the office on Aug. 19, 1925; at this time, the duration of the disease was two months. The diagnosis was pemphigus vulgaris. There were multiple small bullae springing from sound skin on the face, nape, hands, wrists, abdomen and upper part of the back. There was some itching, especially on the soles and abdomen, where there were few, if any, lesions. There was also one lesion in the mouth. Injections of sodium arsenate solution and of coagulin were given daily, for one week; later, every second day. After twelve days, new lesions were still appearing.

Course.—The condition slowly improved, with a few temporary exacerbations. The injections of sodium arsenate solution were stopped after seven weeks, but those of coagulin were continued every second day for one month, at which time they were stopped and injections of sodium arsenate solution were recommenced and were kept up for one month. During this month, the patient was at times free from bullae, but only for a day or two at a time. The periods of freedom from any new bullae were more frequent and longer during the month of the administration of the sodium arsenate solution, until for a period of three weeks there were no new bullae. The patient was dismissed for one month, but failed to return for two months. She then showed two small dried lesions, and reported an occasional small bulla. In these two months she had not received any treatment. Twelve injections of sodium arsenate solution, alone, were then given on alternate days; a few scattered lesions were noted during the first ten days, and none thereafter. She was discharged, clinically cured, on March 13, 1926, and was to report at the office in three months. She never appeared though she reported by phone one short outbreak nine months later. Since December, 1926, I have not had any report from her. This patient was always able to come to the office.

CASE 6.—*History.*—J. K., a white man, aged 46, a laborer, an American, had a dermatitis herpetiformis which began about the middle of July, 1926, on the external surface of the arms and legs, sparing the face and neck. The family history was irrelevant. He was admitted to the Barnard Skin and Cancer Clinic on Nov. 13, 1926, with a vesicular eruption that was universal, except on the face. There were some keratoses and small epitheliomas following earlier prolonged arsenic medication with doses of a solution of potassium arsenite given by a private physician. The eruption was extremely itchy. The patient was put on a nonprotein diet, and doses of mercury and chalk were given internally, with local treatment.

Course.—He improved slowly until May 14, 1927, when the condition became much worse, and was diagnosed as pemphigus vulgaris. The keratoses increased. He was admitted to the Barnard Skin and Cancer Hospital on July 8, 1927, with a universal bullous eruption varying in size from that of a dime to that of a dollar. The itching became less and was gone in five days. A week later, on July 20, he had a severe relapse, and the condition became grave. Injections of sodium arsenate solution and coagulin were begun. There was no change in his condition for ten days. Iron cacodylate was then used instead of sodium arsenate solution, and the

patient improved somewhat in a week. A severe general relapse, heart weakness and an edema of the abdomen and feet now occurred. He was given doses of tincture of digitalis and whisky until August 28, and improved steadily. The use of arsenic was stopped on September 2, for ten days, and a marked relapse began. The administration of arsenic was begun again as sodium arsenate solution, and a steady improvement began.

There were no new lesions for four weeks, and injections of arsenic or coagulin were not given for the last three weeks. On October 15, some papular vesicular and bullous lesions appeared, the condition again becoming dermatitis herpetiformis. The patient was discharged from the hospital, and was treated for one month at the clinic with sodium arsenate solution, and discharged clinically cured. There had been no lesions up to the time of writing.

CASE 7.—*History.*—J. A., a white man, aged 59, a laborer, an American, was admitted to the Barnard Skin and Cancer Hospital on Feb. 5, 1927, with an erythematobullous eruption. The distribution was general, and the configuration rather grouped. The primary lesions were erythematous, and the secondary lesions, bullae. The laboratory report was negative, except that the eosinophilia was 19 per cent. The diagnosis was erythema multiforme bullosum. Three weeks later, the eruption developed into true pemphigus vulgaris, the erythema disappearing.

Examination.—At this time the number of white and red blood cells was normal; the eosinophilia was 6 per cent. The results of the examination of the urine were negative; the Wassermann reaction was negative; a culture from a stool was negative, except for colon bacillus; the results of the Kahn test were negative, and a culture from a blister fluid was negative.

Course.—On March 6, the white blood cell count was 13,200, and the eosinophilia, 29 per cent. The patient was given intravenous injections of 1 Gm. tryparsamide weekly, for three weeks, but grew progressively worse, except that on March 26 the number of white blood cells dropped to 10,500, and the eosinophilia to 6 per cent.

The lesions were universal on the surface and in the mouth. The patient was almost moribund. The pulse rate was 110 and temperature 104 F. He was given treatment with iron cacodylate and coagulin; slow improvement began. Whisky was used during this period, but did not help, and the patient became irrational for days at a time. The use of whisky was finally stopped. There were several severe remissions, but he improved steadily after each, and was discharged from the hospital on June 30, almost well. In about two weeks, all the lesions had disappeared and he has remained well since.

This series, therefore, comprises seven cases, in which four of the patients had clinical recoveries, one was vastly improved, able to work and free from lesions for varying periods, and two died. The two series together show clinical cures in ten cases, improvement in one and three deaths.

COMMENT

The most interesting of these were case 1, ending in recovery; case 3, in which the battle is still going on, and case 4, ending in death.

It would appear that sodium bromide or potassium bromide is not indicated as the best sedative, owing to the tendency to produce bullous lesions. The administration of codeine seemed to be harmful in one

case, but beneficial in another. On the whole, of the drugs tried for the purpose, phenobarbital gave the best results. As a heart stimulant, one tablet of a digitalis preparation three times a day for adults, or one daily for a 10 year old child, was satisfactory. The use of whisky was life-saving for the patient in case 6, and almost fatal for the patient in case 7; however, this remedy should certainly be tried when a patient is steadily sinking.

The use of sodium arsenate solution is a help in the frequent cases in which the veins are too small or the bullae and infection too universal for the intravenous route to be used indefinitely. It is also valuable for private patients and patients seen in the office, because of its ease of administration. The injections of iron cacodylate intravenously are probably the stronger method, however, when available. The administration of tryparsamide may be helpful, and further reports on its use, either alone or in conjunction with coagulin, will be of great interest. Finally, the method is long and tedious, almost too tedious in many cases for home use. The expense is prohibitive in some cases, but it should be persevered in, if adopted, until the end, for a number of my patients have made clinical recoveries, when hope, even after long treatment, had been practically abandoned. In relapses also, one should not hesitate to continue or to repeat the treatment. I found that a number of my colleagues did not do so. As regards one type, the acute septic is, as all dermatologists know, the least amenable. One of the three deaths was of this type, and only one of the recoveries. It seems particularly fatal in foreign Jews, and is much more frequent in the east than in the west. The Gentiles seem to resist it better.

ABSTRACT OF DISCUSSION

Dr. Udo J. Wile, Ann Arbor, Mich.: I wish to congratulate Dr. Davis on his continued good results, and am sorry to have to report again the complete failure we have had with this method of treatment. We have an unfortunately large number of cases of pemphigus in Ann Arbor, and ever since Dr. Davis put this method at our disposal we have used the cacodylate of iron and coagulin in our cases. I am not at all certain that we have used the method correctly. If I understood Dr. Davis today, some of the patients received the injections every day, and my understanding from his previous report was that he suggested its use two or three times weekly. I am still of the fond hope that the success which has attended his work and that of Dr. Wende will come to those of us who up to now have to confess our chagrin and humiliation at not being able to get the same results. I still feel that this treatment is perhaps the best that has been offered, coming from so reliable a source as it does, and that those who have had failures should continue its use.

Dr. Robert Hill Davis, St. Louis: I would say in reply to Dr. Wile that I have found it important to give these injections daily in severe cases. In some of them, I start out with daily injections and have had, in some of them, good results. I do not claim 100 per cent results. I said that I would comment on the experience with the tryparsamide method suggested by Dr. Grindon. In one case

in which I used 1 Gm. of tryparsamide weekly, intravenously, the patient became progressively worse until, in despair, I changed to the other method. I do not feel that this is authoritative and know that Dr. Grindon has had good results which I hope he will increase.

The question has been asked why I do not use some other form of arsenic. In my experience other forms have not worked so well. The solution of potassium arsenite, the Asiatic pill and arsphenamine have all been tried at the Skin and Cancer Hospital and have all proved useless.

As to the coagulating preparation, I am not at all sure that some other preparation would not do as well, and perhaps it may be that the same result can be obtained thereby. My only reason for continuing its use is because I have found that, in cases in which I combined the drugs named, the good effect was increased and was more certain.

ULTRAVIOLET LIGHT

PRACTICAL MEASUREMENT OF DOSAGE *

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We believe that at the present time most physicians in prescribing ultraviolet light determine the dosage by looking at a patient and estimating whether the skin is dark or light and asking him whether he is easily burned or tanned in the summer on exposure to the sun. With the diagnosis and the effect from the light which is desired in mind, we decide on the relative sensitiveness of the part to be treated and then from past knowledge of what a particular lamp will do we prescribe the definite number of inches that the lamp is to be placed from the patient and a definite number of minutes of radiation. We have used in ultraviolet light therapy no such factors as the Holzknecht unit, skin unit, etc., which factors have been used so much in prescribing x-ray therapy. The need for such a unit in ultraviolet therapy may not be as urgent as in the case of the x-ray, but a practical unit would be of much value.

Much investigation has been done along chemical, physical and biologic lines, as a hasty reference to any of the newer textbooks on the subject will show, but the day of a practical clinical method of the measurement of a dose which would be quick, easy of application, relatively inexpensive and satisfactorily accurate for practical purposes has not yet arrived. The matter of reviewing some of the recent methods which have been suggested was stimulated by the demonstration which was made at the last meeting of the American Dermatological Association in Baltimore, when Dr. Janet Clark demonstrated the use of lithopone as a means of measuring the dosage of ultraviolet light.

The term erythema dose has been used a great deal in x-ray dosage, although physicians have come to realize the great variation in the meaning of the term as applied to radiotherapy. It is also known that the same degree of variation, or perhaps even more, exists in the reaction of the skin to ultraviolet light. The term is not a satisfactorily accurate standard for use with either the x-ray or ultraviolet light. The

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difficulty of telling the exact beginning of an erythema, the variation in the coloration of the individual skin and the variation in the reaction in various parts of the same person are simply a few indications of the fact that a universal "erythema dose" is not practical. When it comes to the individual, the shortest time of exposure which is necessary to produce an erythema may be of great service in determining the dose for that particular person and with the particular lamp which is being used at that time. The testing of small areas of skin to varying times is a method in common use for determining the minimum time of exposure necessary to produce erythema. This is the method made use of in all the athletic clubs, etc., in which the "light baths" or sun baths are served up in the same way that massage, showers, hair cuts or squash are provided for the members.

TABLE 1.—*Threshold Erythema After Exposure to Ultraviolet Light*

Subject	Duration of Exposure at Five Second Intervals, Seconds	Earliest Erythema, Seconds	Comment
1	20-65	25	Sixty seconds exposure only remained in twenty-four hours
2	20-65	0	
3	30-75	40	Nothing visible in twenty-four hours
4	30-75	50	Nothing in twenty-four hours
5	30-75	30	Sixty seconds exposure persisted in twenty-four hours
6	20-65	0	Blonde, without erythema
7	30-75	50	Erythema at 50 and 75, and none between
8	45-90	45	Nothing visible in eighteen hours

If an "erythema dose" is used, it is necessary to define what is meant by erythema dose—a faint erythema which may be transient, lasting for an indefinite time, disappearing without pigmentation or scaling, one which lasts a definite number of hours and fades without change, or one which lasts longer and produces a slight tan and exfoliation. There is considerable variation in the earliest perceptible erythema and in the duration of its stay.

TESTS USED IN ESTABLISHING THE DOSAGE OF ULTRAVIOLET LIGHT

The tests in table 1 were all made when the lamp had been in operation one-half hour or more and at a distince of 20 inches (50.80 cm.) from the quartz burner to the skin. All tests were made on the flexor surface of the forearm. The test areas at the wrist failed to show an erythema, even with much longer exposure. With the lamp running only ten minutes, a distinctly longer time to produce an erythema was noted in two of the subjects. As a rule the redness appeared in about four hours after exposure.

One author used the term "normal dose," which he defined as "the amount which will produce on the most sensitive skin surface the faintest perceptible erythema," and the same author stated that once this is known a dosage appropriate for the body taken as a whole can be deduced from it, and for any part of the body taken alone. Such a definition will apply perfectly well to one person. It will be necessary, if that person moves to another city, for the tests to be repeated with the new lamp, for there is at present no satisfactory unit by which there can be transferred the dose which was found satisfactory to that particular person.

One other difficulty about erythema presents itself, and that is in connection with the use of arc lamps. The latter produce fewer waves in the region of the spectrum where the maximum erythema dose is produced, namely, about 300 microns, than does the mercury arc lamp. There is considerable evidence to indicate that the rays from the former may be as efficacious as the latter in certain conditions, but it can be seen that an erythema would not be a proper standard to use.

The test with lithopone, suggested in 1924 by Dr. Janet Clark [1] of Johns Hopkins for the dosage of ultraviolet light, was developed by Dr. A. H. Pfund, who made a careful study of the sensitivity of lithopone to ultraviolet light. It was found that a light-sensitive lithopone paint was darkened on exposure to ultraviolet light, at a rate which was comparable to the rate of various physiologic reactions to ultraviolet light. It was found that lithopone is practically insensitive to wave lengths longer than 320 microns, and that from 300 to 230 microns the sensitivity is practically uniform.

The method which has been used in these tests follows closely that suggested by Dr. Clark. An amount of lithopone powder, perhaps about the quantity which would be contained in a 10 grain (0.65 Gm.) capsule, is placed on a piece of glass. About 3 or 4 drops of water are added to make a moderately thick paste. This is stirred up with a glass rod, in order to break up the lithopone powder and get rid of bubbles, and a piece of transparent quartz is pressed down on the lithopone, thus pressing the lithopone paste out into a smooth even layer. These two slides are held together by rubber bands and then exposed to the ultraviolet light with the quartz side facing the light. For the sake of uniformity, these tests were all made at a distance of 20 inches except as indicated. Strips of this lithopone paste are exposed through the quartz glass to the ultraviolet light for successively longer exposures. In testing a new lamp, the first strip may be exposed

1. Clark, Janet H.: A Simple Method of Measuring the Intensity of Ultraviolet Light with Comparative Results on a Number of Physiological Reactions, Am. J. Physiol. **69**:200 (June) 1924.

for thirty seconds, and the time increased by ten seconds for each strip until the end of the slide is reached. The different shades of gray thus obtained are then compared, as Dr. Clark suggested, with a piece of gray paper which has a definite reflection factor of 50 per cent. This comparison must be made immediately, for a change in the darkened color of the lithopone occurs rather rapidly. A stop watch renders the test easier of application and a much truer color value is obtained with daylight than with artificial light. As a definition of one lithopone unit, she has proposed the time required to darken the lithopone to a reflection factor of 50 per cent—in other words, the time necessary to darken the lithopone sufficiently to just match the test color. She further stated that this time, multiplied by the factor 2.1, produces a just perceptible erythema on the average skin, and called attention to

TABLE 2.—*Comparison of Ultraviolet Light Producing Apparatus, Using the Lithopone Unit as a Standard*

Lamp..	Type	Time Necessary to Produce One Lithopone Unit
1	Hanovia	50 seconds
2	Hanovia	1 minute 40 seconds
3	Hanovia	50 seconds
4	Burdick	50 seconds
5	Burdick	40 seconds
6	Water cooled Burdick	1 minute 30 seconds
7	Hanovia	1 minute 20 seconds
8	Arc (double carbon)	3 minutes 15 seconds
9	Hanovia	1 minute 30 seconds

the facts which I have already quoted—the variation of the erythema in persons and in the different parts to be treated. The outfit needed to perform this test is compact, and the time necessary to complete the test should not take more than four minutes.

Dr. Clark showed that this test is satisfactorily accurate within certain limits, and we have been interested in using this test in checking up a number of lamps over a period of several months. The results of these tests on the various lamps are shown in table 2.

The number of hours which each of these lamps has burned and the voltage are unknown, but these factors undoubtedly account for a large part of the difference. Several overhead fixed lamps were tested, but the longer distance made the lithopone unit an unsatisfactory method of measurement.

At first distilled water was used, but so far as we can see for all practical purposes the water from the average tap gives the same results. Pieces of the test paper have been tacked up on the wall and exposed to the light for varying times, but comparatively little fading has occurred. The accumulation of dirt from handling would, we believe, prove more of a factor to be considered than fading.

A number of interesting matters have been brought out in connection with the use of the lithopone test. It was found that the average lamp required about twenty minutes to develop its full efficiency, as is shown in table 3. This exceeds the normal "building up" period suggested by the manufacturers. We had not realized before that such a long time was necessary.

In a few instances, it was also found that the size of the opening through which the ultraviolet light was allowed to play on the paste of lithopone made some difference, as can be seen from table 4.

TABLE 3.—*Comparison of Efficiency of the Lamp After Various Periods of Burning*

Time Lamp Has Burned	Time to Produce One Lithopone Unit
5 minutes	1 minute 10 seconds
10 minutes	55 seconds
15 minutes	50 seconds
20 minutes	45 seconds
25 minutes	40 seconds
30 minutes	40 seconds
2 hours	40 seconds

TABLE 4.—*Influence of Size of Opening in Casing of Lamp on the Time to Produce One Lithopone Unit*

Lamp	Small Opening in Casing of Lamp	Casing Opened Wide
Hanovia	90 seconds	50 seconds
Hanovia	2 minutes 30 seconds	1 minute 40 seconds
Hanovia	2 minutes	50 seconds
Burdick	40 seconds	40 seconds

It was also noted that on exposure the dark color could be allowed to fade out but would be produced again on reexposure, that is, if the mixture was still moist. One slide was allowed to dry after exposure to ultraviolet light, and then had water added to it and the paste mixed; the lithopone unit tested the same. This was repeated five times, but there was no perceptible difference in the time required to produce a lithopone unit even on the last exposure. It was also found that the method proved a good test for quartz. In hunting for a quartz slide, it was definitely proved that a certain slide supposed to be quartz was not quartz at all, because of failure of the lithopone to darken through it.

On exposure to the light, glycerin, used with the lithopone powder, did not give a change in color, but the powder with equal parts of glycerin and water produced the same results as plain water and powder. The law of the inverse square was found to hold true for all practical purposes. Dr. Clark called attention to the fact that if

more than six minutes is required to darken the lithopone to a reflection factor of 50 per cent, the method is less accurate.

There is apt to be, we understand, more or less variation in the lithopone, and this will perhaps constitute a serious difficulty in the way of universal adoption, unless some method of standardization of the lithopone can be found. In a given batch of lithopone, the results are fairly constant—definite enough for all practical work, and the same lithopone furnished a satisfactory means for comparing the ultraviolet intensity of various lamps. It is therefore possible to speak or prescribe in terms of one-quarter lithopone unit, one-half lithopone unit, two, three or four lithopone units. The matching of colors presents some difficulties in this as well as in other methods. We understand that Dr. Clark is now working on another method which may prove even more satisfactory than the one just described.

Among the more recent methods which have been suggested for the measurement of ultraviolet light is the one suggested by McKenzie and King,[2] which is based on the chemical property of liberating chlorine from carbon tetrachloride possessed by the ultraviolet light rays. The chlorine set free is made to displace iodine from potassium iodide, and this iodine tints the carbon tetrachloride pinkish. A pure carbon tetrachloride, contained in a quartz test tube, is exposed to ultraviolet light. After three minutes' exposure at a convenient distance, for example, 6 or 8 inches (15.24 or 20.32 cm.) from the lamp, 1 drop of a 10 per cent solution of potassium iodide in water is added. The tube is shaken vigorously and a pinkish tint develops as a result of the iodine that is set free. This tint is then closely matched against standard tints which are made by dissolving known weights of the element iodine in known volumes of carbon tetrachloride. About six tubes containing different dilutions are used as standards. In working with this test, it was found that a fresh solution of potassium iodide was always necessary, and that a good deal of time was consumed in being sure that the quartz tube was free from any water, and, furthermore, that a relatively large dosage, that is, with the tube close and given for a relatively long time, was needed in order to make satisfactory changes in the color. In addition, the various shades of pink were rather difficult to match together. We did not find the test as satisfactory as the lithopone test.

Another method which was developed in 1912 by Bering and Meyer, and summarized in 1926 by Pohle,[3] is based on the fact that

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2. McKenzie, T. C., and King, A. A.: Practical Ultra-Violet Light Therapy, ed. 1, New York, William Wood & Company, 1926.

3. Pohle, Ernst A.: Standardization of Ultraviolet Rays, J. A. M. A. **86**:818 (March 20) 1926.

a solution of hydriodic acid in water gives off free iodine under the influence of ultraviolet light rays. Three per cent sulphuric acid and 1 per cent solutions of aqueous potassium iodide are mixed, and a few drops of 1 per cent starch are added after exposure to ultraviolet light. The amount of free iodine is found by titration with four hundredth-normal sodium thiosulphate. The normal dose was called that amount of ultraviolet light energy which freed a quantity of iodine equivalent to 10 cc. of the titrating solution. Keller improved and simplified this test by adding the starch solution and 1 cc. of four hundredth-normal sodium thiosulphate before exposure. The time taken for the changing of the coloration of all the solution into a blue marks what was called the normal dose. This photochemical reaction represents the medium erythema dose for the normal skin of the human being. There are almost too many solutions to this method, and they must be fresh. The need for titration and the length of time necessary to perform the test are also points against the universal adoption of such a method.

The accounts of the use of acetone methylene blue [4] and the uranium acetate-oxalic acid were not accurate enough to permit these methods to be tested, but it can be said that chemical methods in general requiring titration and the making up of fresh solutions do not coincide with the usual idea of practicability because of the time element necessary.

Filter papers saturated with solutions of chemicals which change on exposure to ultraviolet light are also advocated, but the standards are subject to fading and, in general, the results are less accurate. The most satisfactorily accurate method is the spectroscope, but we do not know that this has yet been adapted for practical every day dosage.

SUMMARY

Further evidence is presented of the great variation in the reaction of the skin to ultraviolet light and of the fact that the term "erythema dose" means little.

The lithopone test satisfactorily measures the comparative efficiency of various ultraviolet lamps, and as well checks the efficiency of a given lamp from time to time: (1) it furnishes a transferable unit of measurement; (2) it suggests the need of having a lamp "build up" for about twenty minutes and of bearing in mind the size of the opening used; (3) the difficulties of matching colors are a handicap, and the value of the test will depend on the wide distribution of a satisfactorily stable product.

4. Webster, A.; Hill, L., and Eidinow, A.: Measurement of Ultraviolet Light by Means of Acetone-Methylene Blue Solution, Lancet **1**:745 (April 12) 1924.

ABSTRACT OF DISCUSSION

Dr. James Herbert Mitchell, Chicago: Last year, after the meeting at Johns Hopkins, I asked Dr. Clark to send me some of the lithophone and when I reached home it was there. I test my lamp frequently and as a result of these tests, I have changed the burner twice in a year. Using the lithopone test with a lamp having a volt meter makes it easy to determine when a lamp is at its highest efficiency. I was surprised to find how rapidly the burner itself deteriorated.

Clinical Notes

ISCHEMIA OF ONE FINGER

WILLIAM ALLEN PUSEY, M.D., CHICAGO

On Dec. 27, 1928, when the temperature was around freezing, I was driving in a closed car with a chauffeur who, after about half an hour's driving began to exercise his right hand as if it were asleep or otherwise uncomfortable. He finally called my attention to it, and said that he always had the same trouble with the one finger when his hand became cold. To my surprise, I found that there was extreme ischemia of the fourth finger of the right hand. The finger was almost dead white, with no evidence of circulation when pressure was exerted on the nail. All of the other fingers were normal in appearance; they were slightly pink, and the circulation was normal. We drove for more than an hour in the cold after he called my attention to the finger, and the condition remained unchanged. He was driving without gloves, and he repeatedly put his finger in his mouth to warm it. After we finished the drive and he was in a warm room, circulation in the finger gradually returned; it became congested, and the discomfort increased. He said that after his hands were exposed to cold for a short time the finger first became numb, then felt as if it were asleep, and after the exposure to cold continued, became painful. He was a man about 40 years old, of spare build, but with no history of serious illness, and apparently well. He belonged to the working class and was subject to exposure. He attributed the condition to some nondescript bruise of the hand which he had received several years before; the condition had developed gradually, and he thought it was getting more severe each succeeding winter. He volunteered the information that he has a friend who had had the same condition, and who finally had to have the finger amputated because it had become gangrenous. The condition was like that of the familiar ischemia of the fingers on exposure to cold, except that it was confined to one finger. I have not seen a similar case and have not found a report of a similar one in the literature.

News and Comment

PERSONAL

Dr. Sabouraud, it is understood, will retire from the Saint Louis Hospital and the direction of his laboratory at the end of this year. As a token of esteem, his friends and pupils have arranged to present to him his medal, to be engraved by Pommier, and his bust, to be executed by the sculptor Charles Despiau. The presentation will be made in July, during the meeting of the Association of French-Speaking Dermatologists and Syphilographers, of which Dr. Sabouraud is president.

Professor Jeanselme has retired, and his service at the Saint Louis Hospital has been taken over by his successor, Professor Gougerot.

Dr. Sézary has succeeded Dr. Hudelo at the Saint Louis Hospital.

Dr. Touraine and Dr. Weissenbach direct the dermatologic services at the Broca Hospital.

A testimonial dinner to Dr. A. Ravogli will be given at the Queen City Club, Cincinnati, March 12, 1929, by the doctors of Cincinnati, in appreciation of his work as a dermatologist for almost half a century and of his position as a public-spirited citizen. A portrait of him painted by John Weis is to be presented on this occasion to the Cincinnati General Hospital, where it is to be hung with those of other notable members of the Cincinnati profession.

Mayor Murray Seasongood of Cincinnati will speak on Dr. Ravogli as a citizen and Dr. Charles Bonifield on Dr. Ravogli as a friend. Either the Italian ambassador or the consul general will speak for Italy, Dr. Ravogli's native country.

UNION OF SLAV DERMATOLOGISTS

A Union of Slav Dermatologists was organized last year, composed of four national dermatologic societies, Bulgarian, Czechoslovakian, Polish and Jugoslavian, with 400 members. It is intended to hold biennial meetings, the first to take place on June 27, 1929, at Warsaw, Poland.

Obituary

RALPH RANKIN CAMPBELL, M.D.
1867-1928

Dr. Ralph Rankin Campbell died in Los Angeles on Aug. 18, 1928, during an attack of angina pectoris. His medical life was devoted chiefly to the practice of dermatology. His idealism and kindliness won him many friends, and his devotion to medicine and his high standards made him a respected factor in his profession throughout his life. About twenty years ago, ill health caused him to move to California, where he continued actively in practice. His failing health gradually cut him off from participation in public affairs, and eventually curtailed his local activity until he gave up his office two years before his death.

Dr. Campbell was born in Johnstown, Pa., on July 6, 1867. He graduated from Jefferson Medical College in 1896, and began practice in Chicago in 1891, where he remained until 1912, and was associated with the Chicago Polyclinic and Cook County Hospital. He was active in the Section of Cutaneous Medicine and Surgery of the American Medical Association, serving as Secretary of the Section from 1899 to 1906, Chairman for the year 1906-1907, and a member of the executive committee until 1910.

In 1912, he moved to Los Angeles, where he received the appointments of professor of dermatology at the College of Medical Evangelists, and attending dermatologist at the Los Angeles County Hospital. He was a pioneer in modern dermatology in southern California.

Dr. Campbell was a member of the Loyal Legion of the United States, the American Medical Association, the American College of Physicians and, for many years, of the American Dermatological Association, and an honorary member of the Los Angeles Clinical and Pathological Society.

Abstracts from Current Literature

THE HEREDITARY FACTOR IN ALLERGIC DISEASES WITH SPECIAL REFERENCE TO THE GENERAL HEALTH AND MENTAL ACTIVITY OF ALLERGIC PATIENTS. R. M. BALYEAT, Am. J. M. Sc. **176**:332 (Sept.) 1928.

In this study, it was found that heredity apparently was the chief factor in determining the development of an allergic state, and to some extent governed the time in life when symptoms would appear.

The earlier the sensitivity developed, the greater would be the possibility of the patient becoming sensitized to more than one protein group; the greater the amount of exposure, the greater would be the patient's liability to allergy.

Patients may be sensitive to nitrogenous or non-nitrogenous substances which may also be found in breast milk and in cow's milk. Children may be born specifically sensitive, but only the ability to become sensitive is transmitted, not the specific state.

Eczema and migraine were found to be interchangeable with hay-fever and asthma, but an increased resistance to other infections was observed in these allergic persons.

ADDISON'S DISEASE IN THE NEGRO: REPORT OF THREE CASES. L. S. EVANS, Am. J. M. Sc. **176**:499 (Oct.) 1928.

A case of Addison's disease is reported on account of its rarity in negroes; however, this condition is regarded as probably more common than is generally supposed. The diagnosis is difficult because of the natural pigmentation.

THE BASAL METABOLISM IN LYMPHOBLASTOMA. C. I. KRANTZ, Am. J. M. Sc. **176**:577 (Oct.) 1928.

The basal metabolic rate is usually elevated in widespread lymphoblastoma. This may be reduced, together with associated symptoms, by roentgen rays on radon. Patients with increased basal metabolism may be treated by irradiation in spite of the presence of leukopenia, the metabolic rate serving as a determining factor in therapy and prognosis.

RAYNAUD'S DISEASE ASSOCIATED WITH CANCER OF THE STOMACH. T. I. BENNETT and E. P. POULTON, Am. J. M. Sc. **176**:654 (Nov.) 1928.

On postmortem examination, a man, aged 60, was found to have had a carcinoma of the stomach with secondary metastases in the inferior cervical ganglion. Raynaud's disease, in this case, was considered to be due to the presence of carcinomatous cells in the ganglion.

A CLINICAL COMPARISON OF THE KOLMER MODIFICATION OF THE WASSERMANN TEST AND THE KAHN PRECIPITATION TEST IN SYPHILITIC AND NONSYPHILITIC CASES. MARY C. MCINTYRE and R. L. GILMAN, Am. J. M. Sc. **176**: 843 (Dec.) 1928.

In proved syphilitic cases, there was absolute agreement in 50.9 per cent of 1,702 tests in 631 cases. In proved nonsyphilitic cases, the percentage was much higher, 75.8 per cent, although in this class of cases the absolute and relative agreement together was 98.6 per cent.

Miscellaneous dermatoses were eliminated about equally well by the Kahn and Wassermann tests.

In the proved cases of syphilis least disagreement was noted in the primary and secondary cases, but the greatest was found in syphilis of the central nervous system and in late cutaneous syphilis.

In cardiovascular syphilis, the Kahn test was more sensitive, although a mildly positive reaction may be nonspecific.

It is suggested that more investigation is needed regarding the agreement of the two tests with the clinical observations, and that both tests should be performed simultaneously on every serum.

MARKED MONOCYTOSIS ACCOMPANIED BY A NEUTROPHILIC LEUKOPENIA FOLLOWING ANTISYPHILITIC TREATMENT. C. P. WILSON, Am. J. M. Sc. **177:** 88 (Jan.) 1929.

A case is reported in which symptoms of a severe general reaction developed three weeks after antisyphilitic treatment was instituted. Leukopenia was present, also a depression of polymorphonuclears and a stimulation of monocytes.

RELAPSING FEBRILE NODULAR NONSUPPURATIVE PANNICULITIS. H. A. CHRISTIAN, Arch. Int. Med. **42:**338 (Sept.) 1928.

With the case here recorded, making three in all, Christian has given a good descriptive title to this disease. The lesions consist of nodular nonsuppurative inflammatory areas in the panniculus adiposus, resulting in a localized atrophy which subsequently causes a depression in the skin simulating a scar. The skin, however, is not involved in the process. Cultures were negative, and no organisms could be found. Fatty tissue necrosis were noted, some of which was becoming infiltrated with lymphoid and plasma cells.

XANTHOMATOSIS AND THE RETICULO-ENDOTHELIAL SYSTEM: CORRELATION OF AN UNIDENTIFIED GROUP OF CASES DESCRIBED AS DEFECTS IN MEMBRANOUS BONES, EXOPHTHALMOS AND DIABETES INSIPIDUS (CHRISTIAN'S SYNDROME). R. S. ROWLAND, Arch. Int. Med. **42:**611 (Nov.) 1928.

After an extensive review of this subject and reported cases, Rowland believed that xanthoma represents a mixed steatosis, in which phosphated and more complex lipoids are concerned in association with glycerin fatty acid esters. The lesions are extremely vairable in their histologic appearance and are not confined to the skin and certain internal structures, but may involve the mesenchymal portion of the blood and lymph vessels generally. This process may occur at all ages, the slow adult forms appearing as discrete nodular lesions, and the rapidly developing infantile cases presenting a more diffuse process.

SYPHILIS OF THE STOMACH WITH SPECIAL REFERENCE TO CERTAIN DIAGNOSTIC CRITERIA. H. A. SINGER and F. G. DYAS, Arch. Int. Med. **42:**718 (Nov.) 1928.

As a result of their investigation of cases diagnosed as acquired syphilis of the stomach, the authors concluded that their criteria of proof of syphilis were too stringent. In no case could they find undoubted proof of *Spirochaeta pallida* or the classic gumma. They think that gastric syphilis furnishes clinical, laboratory and anatomic evidences which justify the diagnosis, when considered collectively.

JAMIESON, Detroit.

LEPROSY IN THE UNITED STATES. RALPH HOPKINS and OSWALD E. DENNEY. J. A. M. A. **92:**191 (Jan. 19) 1929.

A statistical study was made of 718 cases treated in the past thirty-four years in what is now the National Leprosarium. Of this number, some 500 patients were natives, though just what proportion of these had foreign born parents is not known. There were twice as many whites as negroes, and males predominated over females in a proportion of more than 2 to 1. The social status of the patients represented a cross section of the normal populace. Forty per cent of the cases were of the skin type, 11 per cent of the nerve type and the remainder of the mixed

variety. An astonishingly large number of the cases were familial; that is, the patients were closely related by blood. A few families were affected almost to complete extinction.

The disease appeared to manifest itself at all ages about equally, though there was a slight increase at the age of puberty. In five of the cases, the incubation period was calculated to be not less than six years—the duration of leprosy approximately fourteen years. Since the rigid rules for parole have been in effect, and with better institutional facilities, relapses in discharged patients have been uncommon, and the mortality rate has been definitely decreased.

RATTNER, Chicago.

INFLUENCE OF LIGHT ENVIRONMENT ON THE ORGANIC CONSTITUTION OF NORMAL RABBITS WITH ESPECIAL REFERENCE TO THE ACTION OF NEON LIGHT. W. H. BROWN, J. Exper. Med. **48**:567 (Oct.) 1928.

Comparison was made of the weights of organs of rabbits living under neon light, in the dark and in diffuse filtered sunlight. An effect was produced by light environment comparable to the effects produced in functional activity.

Black and white animals showed some constitutional differences and did not respond equally to changes in environmental conditions.

ETIOLOGY OF OROYA FEVER: XII. CHEMOTHERAPY IN EXPERIMENTAL BARTONELLA BACILLIFORMIS INFECTION. H. NOGUCHI, J. Exper. Med. **48**:619 (Nov.) 1928.

In these experiments, arsphenamine, neoarsphenamine, bismuth lactate, esters of chaulmoogra oil, sodium gynocardate, neutroflavine and methenamine were employed. Injections were given before the lesions had reached their full development and also after their maturity. Injections given before maturity had no effect on the growth of the lesions, but when administered after maturity they hastened involution of the nodules.

In cultures, the most active bactericidal agents were formaldehyde and neutroflavine.

THE CLINICAL SIGNIFICANCE OF THE LIFE CYCLE OF THE PARASITE IN INDUCED MALARIA. N. KOPELOFF and C. O. FIERTZ, J. Exper. Med. **48**:664 (Nov.) 1928.

In the detailed microscopic study of the life cycle of the malaria parasite, the most significant observation was the total absence of gametocytes. These inoculations, 300 in all in patients with general paralysis, had been made intravenously, a single strain of the organism being used.

The advantage claimed for a strain free from gametocytes is that there is no possibility of transmitting malaria to other members of the community and also that it precludes relapses following the administration of quinine.

IV. INFLUENCE OF LIGHT ENVIRONMENT ON NORMAL RABBITS; CALCIUM AND INORGANIC PHOSPHORUS IN THE BLOOD OF RABBITS. W. H. BROWN, J. Exper. Med. **49**:103 (Jan.) 1929.

The chemical equilibrium of the blood was definitely affected by keeping rabbits under varying light conditions (neon light and darkness). The effects could be correlated with differences in organic constitution and with certain differences in functional activity which involved nutrition, growth and the proliferative activity of the hair follicles.

SUBACUTE INGUINAL LYMPHO-GRANULOMATOSIS. C. L. WILMOTH, J. Trop. Med. **31**:153 (July 2) 1928.

A description of this disease is given, with a report of thirty cases. A certain percentage of the patients recovered without medication or after various forms of

medication. The period of disability was greatly shortened by incision, or, preferably, excision, of the affected glands.

TINEA FLAVA. E. C. SMITH, J. Trop. Med. **31**:169 (July 16) 1928.

Tinea flava is described as pityriasis versicolor flava and produces a macular or patchy fawn or yellowish-brown eruption which appears chiefly on the face, neck, chest and arms. The lesions begin around and affect mainly the hair follicles, and the organism is often found at a considerable depth.

The causative organism is *Malassizia tropica* Castellani, 1905; its cultural characteristics are given in detail.

THE CREEPING ERUPTION OF NATAL, KNOWN AS SANDWORM DISEASE. F. G. CAWSTON, J. Trop. Med. **31**:201 (Aug. 15) 1928.

Sandworm disease is due to the larvae of *Gnathostoma* and its allied parasites which may penetrate the dry skin of the hand or foot. The tunnel caused by these parasites can be found on section, but the larvae have not yet been discovered in the skin. The condition is readily curable if the larvae can be found and destroyed by excision or freezing.

GRANULOMA VENEREUM—ITS DIAGNOSIS AND TREATMENT. G. GIGLIOLI, J. Trop. Med. **31**:245 (Oct. 1) 1928.

After reviewing the work done on the etiology of veneral granuloma, the writer concludes that for the present the diagnosis must rest, in most cases, on the clinical character and course of the disease and on the response to antimony treatment.

He believes it advisable to distinguish between the primary condition and the later involvement of genital and neighboring regions. Differential diagnosis is discussed with regard to chancroid, chancre, herpes, balanoposthitis, phagedenic syphilitic ulcerations, condyloma acuminata and inguinal lymphogranulomatosis.

With two exceptions, the use of antimony was followed by rapid improvement and cure. It is recommended that one or two courses of antimony be given after clinical healing has taken place, and that more than one preparation of antimony be used if the case is refractory to treatment.

A CASE OF ERB'S SYPHILITIC PARALYSIS IN AN AFRICAN. J. Trop. Med. **31**: 289 (Nov. 15) 1928.

A case is reported in which complete paralysis occurred with slight wasting of the legs. Recovery followed treatment with neoarsphenamine, although there was no definite history of syphilis and the Wassermann reaction in the blood was negative. The cell count in the spinal fluid, however, was 25, and the sigma reaction was 10.

THE VALUE OF EXAMINING THE CEREBROSPINAL FLUID IN LEPROSY. R. STANZIALE, J. Trop. Med. **31**:305 (Dec. 1) 1928.

Examination of the cerebrospinal fluid was made in ten cases of leprosy to determinine the Wassermann reaction and the presence of globulin, hyperalbuminosis, lymphocytosis and Hansen's bacillus.

No bacilli were found in the fluid after centrifugation, and the results of other examinations were variable and did not correspond to the clinical symptomatology.

The writer concluded that examination of the cerebrospinal fluid in leprosy is not of practical importance.

ANGIOMA OF GLANS PENIS. T. E. GIBSON, J. Urol. **20**:501 (Oct.) 1928.

A case of angioma of the glans penis believed to be due to trauma fourteen years preceding the development of the lesion is reported.

JAMIESON, Detroit.

LEPROSY. MAJOR H. W. WADE, Mil. Surgeon **64**:81 (Jan.) 1929.

The author discusses symptoms, pathology, diagnosis and treatment in a short article. Leprosy is classified into neural and systemic types. The bacteriology and modes of infection are also considered.

RATTNER, Chicago.

AMYLOIDOSIS OF TONGUE. M. LETULLE, G. PETIT and MOREAU, Ann. de dermat. et syph. **9**:1033 (Dec.) 1928.

A case of this rare condition is recorded. On the tongue of an old woman appeared a small submucosal nodule which slowly enlarged. The tumefaction progressed; finally the tongue filled the whole buccal cavity. There was no pain. Pathologic study showed amyloid degeneration, probably following tertiary syphilis. A detailed description of the microscopic observations is given.

A BULLOUS CUTANEOUS DYSTROPHY WITH ATROPHY AND WHITE PAPULOID LESIONS. A. PASINI, Ann. de dermat. et syph. **9**:1044 (Dec.) 1928.

Pasini describes two cases which might be classed as epidermolysis bullosa heredetaria with secondary milia. In one case, however, there were lesions which have not been previously described. These were ivory white, small, conical eminences of an elastic consistency which were not preceded by bullae. They were always perifollicular in site and increased gradually to an average size of 15 mm. Some of the developed lesions were occasionally capped by a bulla. They appeared more profusely on the trunk than elsewhere. Histologically, there was a hyperplasia of the collagen in the upper cutis and an apparent increase in the elastic tissue.

ULCER OF THE LEG CURED BY BACTERIOPHAGE. BIZARD, MARCERON and P. ROSENTHAL, Bull. Soc. franç. de dermat. et syph. **35**:790, 1928.

A large ulcer of presumed tuberculous origin with secondary contamination peeled quickly on the local applications of a stock of bacteriophage.

PRECOCIOUS MALIGNANT SYPHILIS PRODUCING SEVERE DESTRUCTION DESPITE TREATMENT. MILIAN, L. PERIN and L. MICHAUX, Bull. Soc. franç. de dermat. et syph. **35**:791, 1928.

In the case reported, the chancre cicatrized as a result of specific treatment, but shortly thereafter destructive lesions appeared and, despite further treatment, led to the loss of one eye. The process was finally stopped by the employment of mercury.

EPITHELIOMA FOLLOWING A BURN WITH HOT TAR. MILIAN and GARNIER, Bull. Soc. franç. de dermat. et syph. **35**:793, 1928.

The authors record a case of spinocellular cancer developing on the skin about three weeks after the area was burned with hot tar. The patient worked with tar, and the lesion was considered of occupational origin.

INTRADERMIC REACTIONS FROM STREPTOCOCCIC VACCINE IN PITYRIASIS ROSEA. L. PERIN, Bull. Soc. franç. de dermat. et syph. **35**:795, 1928.

The author followed the usual technic of intradermic reactions in this investigation. Twenty patients with pityriasis rosea gave positive reactions. The reaction was also positive for some time after the disease had disappeared. Suitable controls seemingly showed that the positive reactions had some significance. The author believes his results are a point in favor of the streptococcic origin of pityriasis rosea.

SCLERODERMIFORM TUBERCULOUS SARCOID. GOUGEROT and BURNIER, Bull Soc. franç. de dermat. et syph. **35**:802, 1928.

The patient presented on each leg an ill defined ligneous infiltration which histologic study showed to be allied to Bazin's disease. The sclerodermatous aspect

was explained by the marked fibrosis. There was a focal and systemic reaction to tuberculin and amelioration on the therapeutic employment of that substance.

RAYNAUD'S DISEASE: SCLERODERMIFORM ASPECT OF THE FACE, LIPOMATOSIS OF THE EXTREMITIES, ETC. GOUGEROT and BURNIER, Bull. Soc. franç. de dermat. et syph. **35**:803, 1928.

The patient had typical Raynaud's disease associated with lipomatosis of the upper extremities and edema of the face producing a masklike appearance.

NEVUS WITH ATROPHIC POINTS NOT PRECEDED BY ULCERATION. GOUGEROT and BURNIER, Bull. Soc. franç. de dermat. et syph. **35**:804, 1928.

The child whose case was the subject of this report presented a vast portwine mark which was undergoing areate regression without ulceration.

CASE FOR DIAGNOSIS. GOUGEROT and P. BLUM, Bull. Soc. franç. de dermat. et syph. **35**:805, 1928.

The eruption was localized especially on the trunk and consisted of patches of psoriasiform aspect, developing into a central achromic area, surrounded by a papular ring, and finally leaving a depigmented area.

THE IMPORTANCE OF THE PAPULE (ELEMENTARY LESION) IN POIKILODERMA (PETGES-JACOBI). GOUGEROT, O. ELIASCHEF and LOTTE, Bull. Soc. franç. de dermat. et syph. **35**:806, 1928.

The authors called attention to the elementary lesion of this disease; a small, round, lichenoid papule, with scaly or brilliant surface. It is the primary lesion, which has been noted but not stressed, according to the authors.

KELOIDS FOLLOWING ZOSTER. GOUGEROT and CARTEAUD, Bull. Soc. franç. de dermat. et syph. **35**:809, 1928.

A brief report is made of keloidal formation in the scars of lesions due to zoster.

POST-TRAUMATIC SYPHILIS. GOUGEROT, KUSS and P. THIROLOIX, Bull. Soc. franç. de dermat. et syph. **35**:809, 1928.

In a person with proved syphilis, trauma of the knee was followed by osteoarthritis with hydrarthrosis. An operation was done and ulceroserpiginous syphilids developed around the scar.

MILIARY NODULAR TUBERCULOSIS SIMULATING ACNITIS. GOUGEROT, BARTHELEMY and LOTTE, Bull. Soc. franç. de dermat. et syph. **35**:811, 1928.

A case of lupus miliaris disseminatis facei is described.

ERYTHEMA PERSTANS ASSOCIATED WITH VITILIGO. LOUSTE and THIBAUT, Bull. Soc. franç. de dermat. et syph. **35**:813, 1928.

The patient presented large violaceous, polycylic patches of one year's duration. In addition to this eruption, she had vitiligo of many years' standing. There was some evidence of moderate pluriglandular dysfunction.

GENERALIZED SARCOMATOSIS. LOUSTE, CAILLIAU and R. COHEN, Bull. Soc. franç. de dermat. et syph. **35**:816, 1928.

In this case, there was a generalized cutaneous nodular eruption with visceral invasion. Biopsy showed cells of atypical lymphocytic type. There was no alteration in the blood cell count.

THE PATHOGENESIS AND TREATMENT OF ARSENICAL ICTERUS. P. RAVAUT, Bull. Soc. franç. de dermat. et syph. **35**:818, 1928.

Ravaut remarks on the differences of opinion regarding the origin and treatment of icterus occurring during arsenical antisyphilitic therapy. His own ideas on this subject have undergone modification from time to time. Milian has always championed the theory that icterus occurrirng during treatment with arsphenamine was of syphilitic origin and called for continuation of specific therapy, but Ravaut rejects this conception, at least partially, since his experience has shown some disastrous results from the continuation of treatment with arsphenamine.

He then discusses the origin of the jaundice under question and its proper therapy, and sums up by taking a middle ground on most points. Prudence demands a cessation of arsenicals, but continuation of treatment with mercury or bismuth. He has found sodium thiosulphate valuable.

DERMATITIS VENENATA FROM A VOLATILE INSECTICIDE. MARCERON, Bull. Soc. franç. de dermat. & syph. **35**:829, 1928.

A case is reported of erythematosquamous dermatitis on the scalp and face traced to a common household insecticide.

CENTRIFUGAL ANNULAR ERYTHEMA EVOLVING INTO DUHRING'S DISEASE. HUDELO, RABUT and GUEX, Bull. Soc. franç. de dermat. et syph. **35**:830, 1928.

The eruption at first consisted of two spreading, annular lesions. They were extremely itchy. At this stage, erythema annulaire centrifuge (Darier) seemed the correct diagnosis. Later, bullae appeared suggesting Duhring's disease. The eruption finally presented a polymorphous aspect, with papules, erythematous patches, annular lesions and bullae. Eosinophilia was present. The literature contains examples of other cases in which the same course was followed, so there seems justification for regarding some cases of so-called erythème annulaire centrifuge as the initial stage of dermatitis hepetiformis.

WASSERMANN-FAST CONGENITAL SYPHILIS IN TWO SISTERS. SCHULMANN and GEORGES-LEVY, Bull. Soc. franç. de dermat. et syph. **35**:836, 1928.

The interest in these cases resides in the fact that two sisters with congenital syphilis were Wassermann-fast, despite every therapeutic endeavor.

TREATMENT OF WARTS WITH AUTOHEMOTHERAPY. A. SEZARY, Bull. Soc. franç. de dermat. et syph. **35**:839, 1928.

Sezary has had excellent results in both plane and vulgar types of warts with this method. From five to twelve injections were given.

USE OF BONAIN'S LIQUID IN ANESTHESIA OF MUCOUS MEMBRANES. A. MARIN, Bull. Soc. franç. de dermat. et syph. **35**:841, 1928.

The mixture described consists of menthol, phenol and cocaine in equal parts. It is applied on cotton and is recommended for superficial minor surgical procedures.

ERYTHEMA MULTIFORME IN RECURRENT ATTACKS. P. LANZENBERG and E. WALTER, Bull. Soc. franç. de dermat. et syph. **35**:845, 1928.

The eruption was present in the face and backs of the hands. In the latter areas, it was typical of the disease, while in the former it was infiltrated and firm to the touch. Crops of lesions had appeared for about six months.

SCLERODACTYLIA AND RAYNAUD'S DISEASE. L. M. PAUTRIER and F. WORINGER, Bull Soc. franç. de dermat. et syph. **35**:849, 1928.

Following continued exposure to cold in her occupation, the patient showed acrocyanosis of the hands, which, in the past few months, was succeeded by a

progressive sclerodactylia of the hands and upper extremities. Symptoms of Raynaud's disease also appeared.

UNRECOGNIZED GUMMA EVOLVING INTO A VAST INFILTRATED PLAQUE AFTER INCISION. J. ROEDERER and F. WORINGER, Bull. Soc. franç. de dermat. et syph. **35**:853, 1928.

A nodule developed in the right parietal region, which, under a mistaken diagnosis, was incised. Following this, there was rapid extension with ulceration. The authors call attention to the case as a warning against heedless surgery.

PURPURA AND ERYTHEMA PURPURICA FOLLOWING SERUM TREATMENT. LANZENBERG, WALTER and MLLE. ULLMO, Bull. Soc. franç. de dermat. et syph. **35**:856, 1928.

The patient received antitetanic serum followed in two days by an eruption resembling erythema multiforme with a purpuric element.

RESULTS OF THE TREATMENT OF LUPUS ERYTHEMATOSUS WITH GOLD SALTS. L. M. PAUTRIER and G. LEVY, Bull. Soc. franç. de dermat. et syph. **35**:858, 1928.

The authors record the results obtained with gold compounds in fifteen cases of the disease. Their results were excellent. Only two patients showed intolerance and that in only a mild degree.

MICHAEL, Houston, Texas.

DERMATOLOGIC ABSTRACTS

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

ACUTE CURABLE FORM OF TABETIC ATAXIA. J. DECOURT, Bull. méd., Paris **36**:1493 (Nov. 24) 1928.

Decourt calls attention to certain forms of ataxia in latent tabes spinalis. These forms appear usually in patients who seem to be healthy, but who, in a few hours, develop all the signs of typical locomotor ataxia, the only difference being that the deep sensibility is not altered. The Wassermann test is not always positive, but there are pupillary tabetic signs and an absence of tendon reflexes. The cerebrospinal fluid reveals lymphocytosis hyperalbuminosis and a positive benzoin test. With energetic bismuth, iodine and mercury treatment (no arsenicals), a cure is obtained in several months.

POSITION OF ARM IN INTRAVENOUS INJECTIONS. C. MANTOUX, Presse méd. **36**:1493 (Nov. 24) 1928.

To facilitate the flow of the blood into the syringe in the beginning of an intravenous injection, Mantoux advises that the arm of the patient be permitted to hang by his side. Then the needle will be directed obliquely from below upward, the bottom of the syringe will be below the point of puncture of the vein, and the force of gravity will favor the flow of the blood.

LATE HEREDOSYPHILIS OF CEREBROSPINAL NERVOUS SYSTEM. H. FAURE-BEAULIEU, Presse méd. **36**:1539 (Dec. 1) 1928.

Faure-Beaulieu calls attention to the possibility of late manifestations of hereditary syphilis. He reports the case of a woman, whose father was syphilitic and whose brother had an early heredosyphilis, who developed the first signs of

slowly progressing pyramidal sclerosis with some slight meningeal manifestations at the age of 33. The initial symptoms were root pains in the right side of the thorax and slight disturbances in gait, accompanied by a foot clonus on the right side. In the course of sixteen months cephalalgia, vertigo, slight visual disturbances and paresthesia appeared, together with exaggeration of the Babinski and patellar reflexes on the side of the foot clonus and disappearance of the abdominal reflexes. Optic neuritis, without stasis, was found on ophthalmologic examination; lymphocytosis and increased albumin and globulin were found in the cerebrospinal fluid. The Wassermann reaction was negative.

RELATION OF HERPES ZOSTER TO VARICELLA. H. ALTERTHUM, Monatschr. f. Kinderh. **40**:330 (Oct.) 1928.

Of thirty-six cases of herpes zoster reported on by Alterthum, twenty-three were associated with varicella. The incidence of herpes zoster varicellosis was not dependent on the frequency of varicella but showed a remarkable increase in certain years. Seven times, Alterthum observed zoster after an injection of arsenic; six of these patients became ill with varicella. This shows that arsenic zoster, too, may arise from varicellosis. Recovery from varicella does not, however, confer immunity to herpes zoster, or vice versa. As a prophylactic measure against varicella, patients with herpes zoster should be isolated at once.

TREATMENT OF FURUNCLE AND CARBUNCLE. HEDDAEUS, München. med. Wchnschr. **75**:2052 (Nov. 30) 1928.

Heddaeus asserts that furunculosis is not caused by a bad state of the blood. It is always caused by outward conditions and usually begins in an infected hair follicle. Though some persons, diabetic patients, for instance, are more subject to this kind of infection, the immediate cause is external. To prove this statement he points out that, if a patient with an isolated furuncle is properly treated, the infection does not spread. Concerning the treatment of large carbuncles, he says that in recent years he has employed artificial light therapy with great success. After this treatment has been applied for several days a pull on the overlying skin will permit a free escape of the pus. Later the necrotic tissues can be extracted by means of small forceps. The advantage of this method over the older methods of excision is that the resulting scar is hardly noticeable and the pains diminish after the first irradiation. Heddaeus recommends this method also for the treatment of furuncles, especially those in the axilla and on the lips.

RESULTS OF ROENTGEN TREATMENT OF MALIGNANT TUMORS. W. SCHMIDT, Strahlentherapie **30**:197 (Oct. 5) 1928.

Schmidt reports on the results of high voltage treatment in the Göttingen university clinic between 1919 and 1927. He concludes that for operable tumors it cannot compete successfully with surgery. Skin carcinomas are an exception; in cancroid, when it is multiple or when the age or the cosmetic point of view must be considered, primary irradiation is indicated. But if superficial cancer of the skin proves refractory to the rays, a radical operation should be performed promptly. Postoperative irradiation has improved the results in cancer of the breast. It should also be given in all cases in which the operation was not radical and after radical operation for sarcoma of the trunk. Roentgen treatment is worth trying in all inoperable tumors, except with extreme cachexia and in certain carcinomas of the gastro-intestinal tract. He has found it useless in esophageal carcinoma. Local recurrences are more easily influenced by irradiation than lymph node or bone metastases, but its analgesic effect on bone metastases is noteworthy.

Society Transactions

NEW YORK ACADEMY OF MEDICINE, SECTION ON DERMATOLOGY AND SYPHILOLOGY

R. H. Rulison, M.D., *Secretary*

Regular Monthly Meeting, Oct. 3, 1928

Isadore Rosen, M.D., *Chairman*

Poikiloderma Vasculare Atrophicans. Presented by Dr. Abramowitz.

I. M., a man, aged 30, born in Russia, reported to the Skin Clinic of the New York Post-Graduate Hospital on July 11, 1928. Seven years previously he had noticed an eruption in the popliteal spaces. In a year or two it had involved the inner aspects of both thighs. On examination, large, well defined, dark, reddish-brown, pigmented patches were found in the popliteal spaces and on the inner aspects of the thighs, which extended from the middle of the thighs to the middle of the legs. There were telangiectatic and hemorrhagic spots in the lesions and atrophy. A biopsy taken at the Vanderbilt Clinic revealed poikiloderma.

Poikiloderma Vasculare Atrophicans. Presented by Dr. Abramowitz.

P. S., a man, aged 30, born in Denmark, called at the Skin Clinic of the New York Post-Graduate Hospital on Aug. 22, 1928. He said that the condition began ten years previously. Four or five well defined plaques, the size of a palm, were found on the back. There were a number of telangiectatic areas in the patches. The lesions varied from a dark blue to a reddish brown, with some atrophy. A biopsy confirmed the diagnosis.

DISCUSSION

Dr. Lane: I hesitate to say anything about the cases of poikiloderma that have been presented because it is hard to have a definite opinion. The case that I first described was a typical case of poikiloderma, as described by Jacobi, about which there was no doubt. Most of the cases seen since have been doubtful. So few cases have been described and reported that the full clinical picture has probably not been definitely fixed. In the case of the patient who was presented last, I could see almost no resemblance to poikiloderma. The eruption was not symmetrical. Pigmentation was much more marked than in most cases, as well as more uniform. There is some atrophy but the telangiectasia is less marked. The appearance of typical poikiloderma is more like the typical appearance of the telangiectatic sequelae of radiodermatitis than anything else; I think no one would think of that condition in this patient. What the diagnosis is, I have no idea.

The condition in the first case Dr. Abramowitz presented more nearly resembles poikiloderma. It is more nearly symmetrical, but is much less widespread than in most of the cases reported. There is less atrophy and wrinkling than one would expect in a case of as long standing and there is not the marked telangiectasia and the marked atrophy that is found in the typical case. I think it is perfectly within the range of possibility that this case is a case of poikiloderma, but I do not think one can express any definite opinion on it.

Dr. Gross: We had occasion to see the first patient about four or five months ago at the Vanderbilt Clinic. Our clinical diagnosis at that time was poikiloderma; the histologic observations seemed to conform with this diagnosis. The only other possibility we considered clinically was that of a parapsoriasis en plaques (Brocq). It may sound strange to mention this condition in connection with the differential

diagnosis of poikiloderma, but if one examines some old lesions of definite cases of parapsoriasis en plaques carefully one does find atrophy besides the so-called pseudo-atrophy. This has been pointed out sufficiently in the more recent literature, and for a long time Rille, among others, has advocated the close relationship of the condition described by Brocq to the idiopathic atrophies. I do not speak in this connection of the parapsoriasis atrophicans described by Kreibich, which presents the picture of pityriasis lichenoides.

DR. ABRAMOWITZ: I realize these are not fully developed cases of poikiloderma vasculare atrophicans. When one realizes that some dermatologists are not willing to consider poikiloderma as a true entity, one can expect in the early stages of the disease to find some difference of opinion as to the exact diagnosis. One could not classify this dermatosis in any other group except that of poikiloderma vasculare atrophicans. Further observation will prove whether or not we are correct in our diagnosis.

A CASE FOR DIAGNOSIS (ENDOTHELIOMA?). Presented by DR. WYETH.

C. Z., a man, aged 20, a lead burner's helper, had a family history that was negative except that his mother's brother had had a large, hairy, pigmented nevus situated on the left thigh. The patient's eruption had first been noted on the face and chest at the age of 8 months, and thereafter had spread rapidly over the entire body. This condition suggested livido reticularis. Tumors in the skin first appeared on both lower legs four years prior to presentation, and were soon followed by involvement of the toes, penis and forearms. Itching had been confined to these areas and the tumors had gradually increased both in size and in number since they had first appeared. One year before presentation, several tumors on the leg were treated by surgical diathermy, and the tumors had not recurred. The patient's general condition had been excellent, with no loss of weight; no abnormal cardiorespiratory, gastro-intestinal or genito-urinary symptoms were present. The Wassermann reaction was negative on two examinations.

Microscopic examination showed a cellular process which was closely associated with the small capillaries and which possibly arose from them. Some of these cells were pigment-bearing. There was no evidence of neurofibroma or epithelioma. The process was benign. The histology suggested endothelioma (Ewing-Cutler).

DISCUSSION

DR. FRASER: This is an interesting and puzzling case. The tumors have a firm consistency which suggests an origin from connective tissue. Dr. Ewing's histologic report excludes the diagnosis of either neurofibroma or the ordinary type of fibroma. From the description of endothelial cells closely associated with capillaries, I am inclined to the view that we are dealing with an endothelioma of the nevus type, or capillary hemangioma. As I have not seen the slides, I would hesitate to offer a positive diagnosis.

DR. WILLIAMS: This is certainly a most interesting case. I have never seen anything like these tumors. The histologic diagnosis shows a tumor possibly arising from the endothelial lining of the capillaries. The patient presents two apparently distinct conditions. The tumors are prominent and of recent duration; the discoloration lasted from infancy. Apparently, it is possible to connect the two conditions. The discoloration suggests closely a case described by Dr. Goodman and myself three or four years ago, in a group of children in one family. These cases are not common; however, we did find a number of cases in the literature in which there was this curious discoloration, sometimes in a vascular network, sometimes as congested spots on a pale ground, like livido reticularis, which sometimes develops after exposure to cold or heat, appearing early in life and lasting throughout life. Some disturbance of the vascular system was found regularly, a disorder of the capillaries. We have here the case of a young man who from birth presented a permanent livido and in whom for some unknown reason the diseased capillaries have taken on new growth and produced tumors. I think it is all part of the same process. It would be interesting to have a biopsy

made of one of the spots of livido and see whether diseased capillaries can be found there also.

DR. SATENSTEIN: I think that there are three conditions present. On the chest and abdomen are reddish areas, smooth and not infiltrated, resembling nevus flammeus. On the forearms and thighs are similar reddish areas, slightly elevated and firm, which in places give the impression of deep infiltration. On the lower extremities are reddish tumors. I believe we are dealing with a developmental defect of the superficial vascular system, ranging from nevus flammeus to a tumor stage. One should study the tissue from each one of the areas and note the gradual development of one to the other. I cannot give the clinical conditions a distinct name.

DR. BLOSSER: When one leaves out the tumor part of the skin picture, it seems to me the case resembles angioma serpiginosum. Whether or not angioma serpiginosum ever causes tumor formation, I do not know.

SARCOID OF BOECK. Presented by DR. MITCHELL.

O. P., a man, aged 21, first seen on June 11, 1928, presented circinate, raised, sharply outlined, slightly indurated lesions, varying from pink to purple, on the face, neck and body, which had begun to appear three years previously. The lesions varied in diameter from ⅛ to 1½ inches (0.3 to 3.77 cm.). The larger lesions showed a tendency to clear in the center. There were no subjective symptoms. A tumor removed from the back was examined by Dr. Satenstein, who reported: (1) lymphatic infiltration around the blood vessels, (2) no tubercle formation, (3) no giant cells, (4) no plasma or epithelioid cells. An examination of the blood showed: hemoglobin, 100 per cent; erythrocytes, 4,800,000; leukocytes, 6,200; small lymphocytes, 44 per cent; large lymphocytes, 2 per cent; polymorphonuclears, 54 per cent. The Wassermann reaction was negative. The results of a von Pirquet test were likewise negative. Examination of the urine showed a large amount of albumin. The treatment given from June 11 to September 7 consisted of daily injections, to 15 minims of a 2 per cent solution of sodium arsenate. Since then he received two injections weekly of sodium cacodylate (5 grains). There was no permanent change following treatment, but at times the lesions appeared deeper in color, and seemed much more swollen than usual. In view of the evidence of irritation of the kidney, the arsenic was not given in large doses.

DISCUSSION

DR. LAPOWSKI: I believe this condition is a drug eruption. I do not believe it is sarcoid; there is no scarring. In the dispensary we see hundreds of cases of skin eruptions due to various drugs, especially phenolphthalein.

DR. POLLITZER: I saw this patient three months ago and I was greatly puzzled by the case and made a tentative diagnosis of sarcoid. The condition has undergone decided changes since then; there is nothing like the infiltration that was present three months ago, the lesions have receded and there is more pigmentation. I think the diagnosis of a drug eruption is probably correct. Dr. Satenstein cut some sections from a piece of tissue cut out by Dr. Mitchell and they showed nothing of sarcoid, but rather an indefinite infiltration following the lines of the vessels, a type of low grade inflammation.

DR. MITCHELL: I asked this patient carefully as to whether he had taken drugs before I treated him. He absolutely denied having taken any drugs, but tonight he says he has, at intervals, taken phenolphthalein (Ex-lax). Three lesions have had a tendency to appear larger some days than at other times; sometimes they appear flat. Tonight, the patient told me that a week ago last Monday he took a box of Ex-lax (six tablets). As far as I could ascertain it did not seem to make any difference in the appearance of the lesion. It is a clinically typical sarcoid, but certainly histologically it is not sarcoid. However, it seemed to me that was as good a diagnosis as I could make. I am willing to accept Dr. Lapowski's suggestion of drug eruption for further investigation.

DR. CHARGIN: I am unable to offer a diagnosis. I do not think that we are dealing with a drug eruption. The lesion on the cheek seems to be atrophic and this certainly does not suggest a drug rash. Moreover, some of the lesions on the back seem to show hernia of the skin, which is observed in some of the atrophies.

DR. POLLITZER: Neither Dr. Williams, Dr. Kingsbury nor I are able to find any evidence of atrophy.

DR. ABRAMOWITZ: This patient presents an eruption of the erythema iris type, and while it may be due to the ingestion of phenolphthalein, as far as I know, it is not typical. Repeated test doses of this drug should cause a new flare-up of these lesions irrespective of whether one uses white or yellow phenolphthalein. If Dr. Lapowski sees hundreds of cases of this type in his clinic, I would like to know what drug he has found causes the production of this ringlike eruption.

In justice to Dr. Mitchell I must state that I was perhaps responsible for suggesting the diagnosis of sarcoid in this patient. If one looks at the photograph one will see fairly different looking lesions from those now present. There is no atrophy but there is pigment in some of these lesions.

DR. BECHET: I also believe that the eruption will eventually be found to be due to the ingestion of some drug, either phenolphthalein or something else. The elevated, plateau-like appearance does not eliminate the diagnosis of dermatitis medicamentosa, as I have seen just such an eruption after the ingestion of phenolphthalein.

NEVUS COMEDONICUS. Presented by DR. ANDREWS.

A. J., a white woman, aged 25, born in Armenia, was first seen on July 2, 1928, at which time she applied for treatment for a condition which at first had been noticed at the age of 6. She had been seen and treated with external and internal medication in different clinics. On examination, she presented a condition of the skin which involved the right side of the neck, retro-auricular region, with a streaklike extension to the right side of the sternum and the supraclavicular region, and which left an area, about 2 inches (5 cm.) wide, free and continued down on the back to about the eighth dorsal segment. The lesions consisted of the following elements: there were numerous follicular keratotic plugs, slight café au lait color and grayish-brown pigmentations and numerous blackheads, pitted atrophies resulting from blackheads and areas of fine macular atrophy. All of the lesions were arranged in the form of a systematized nevus. On the lower part of the back were a few larger scars and cystic lesions the size of a pinhead and larger. The section of the skin showed a follicular keratosis as its chief pathologic expression. The follicular wall was thin and apparently pressed out by the keratin plug which consisted of lamellated horny cells, in the center of which one could see a curled hair. About the follicle was a moderate infiltration of cells which were apparently newly formed fibroblasts and a few lymphocytes. Many of the vessels of the corium showed a moderate amount of newly formed connective tissue.

DISCUSSION

DR. WILLIAMS: I examined this case and I see no necessity for coining a word such as nevus comedonicus. There are comedones and atrophy, the atrophy being around the sebaceous follicles, such as may occur in young people in adolescence without inflammatory reaction. It is well recognized as a clinical condition, I would not call it nevus; it is atrophy of and around the sebaceous follicles.

DR. BECHET: I think that this case belongs to a group which is most frequently observed in the preadolescent age. The lesions consist of grouped comedones, which finally exfoliate, leaving pitlike scarring. I agree with Dr. Williams, and do not consider the lesions of a nevoid type.

DR. SATENSTEIN: This patient presents lesions on the face, side of the neck, on the arm and on the back, absolutely unilateral. The lesions are in various

stages of development. The condition began early in life. On the face there are the comedone-like plugs and some reticulated atrophy. On the arm some of the horny plugs are still present, but the majority of them have fallen out. On the back there are a great number of them. I do not see any resemblance to acne, nor are the horny plugs comedones; the histologic observations are not those of acne with comedone formation. I regard the condition as an unusual nevus unius lateralis with horny plug formation and reticulated atrophy. A similar condition was described a few years ago by MacKee.

DR. GROSS: We thought that the condition fitted well into the group of rare nevi reported in the literature as nevus comedonicus. I fully realize that dermatoses like psoriasis, lichen planus and neurodermatitis may occur in a systematized arrangement, but I have never seen acne do so. The condition which this patient presents consists, besides the keratotic plugs, blackheads and cystic formations, of a pigmentation characteristic of birthmarks. Together with the definite unilateral systematized distribution these features are suggestive only of nevoid formation of some kind. The small pitted scars could be explained as pressure atrophy resulting from the comedones.

A CASE FOR DIAGNOSIS (DERMATITIS FACTITIA?). Presented by DR. CANNON.

F. S., a man, aged 26, born in the United States, came to the Vanderbilt Clinic on Sept. 12, 1928, giving the history that he had been suffering from an eruption of papules which were extremely itchy and after scratching developed crusts and then slowly disappeared, leaving a scar. The patient had never been treated. There was no history of previous illness and no family history of any bearing. On examination, many atrophic scars of rather sharply punched-out character, varying in size from that of a pinhead to that of a dime, were found on the entire trunk and less on the arms and thighs. There were a few active lesions present in the form of brownish-red papules, some of which had a crusted center. Besides those lesions, erythematous and slightly scaly patches with hardly any infiltration, varying in size from that of a five cent piece to that of a dollar, were found. On repeated examinations, the patient presented marked dermographism and urticaria factitia. Tentative diagnoses of papulonecrotic tuberculid, urticaria and neurotic excoriations were made. The biopsy did not suggest tuberculosis.

DISCUSSION

DR. ABRAMOWITZ: I am afraid I can throw little light on the diagnosis. It seems to me that the patient has numerous atrophic-like spots that might be classed in the macular atrophies. Whether they are primary or secondary to the pseudonecrotic urticarial lesions is a question. If this were a giant papular tuberculid, I am sure the diagnosis would have been verified by the biopsy report. I presume the few erythematous scaly patches that are present are due to the applications of ultraviolet rays which were received in that area. My diagnosis should be macular atrophy secondary to some other lesion.

DR. WILLIAMS: This case interests me very much indeed. I have no diagnosis to offer. I would make one correction; I examined many of the scars carefully, and many of them seemed to me to be hypertrophic. I think, therefore, macular atrophy will hardly do as a diagnosis. Distinct scar tissue is present.

DR. ELLER: My diagnosis in this case would be dermatitis artefacta or neurotic excoriations, in which the patient has a tendency toward hypertrophic scars.

DR. CANNON: I was impressed by the similarity of the lesions and scars to those of factitious eruptions. I know of no other dermatologic disease that causes excoriated, blood crusted papules and hypertrophic scars such as this patient presents. The cowed expression of the man is often seen in persons with self-inflicted wounds.

SOLID EDEMA OF THE FACE. Presented by DR. COMBES.

N. R., a colored woman, aged 27, first noticed a patch of redness, associated with swelling on the right cheek, seven months prior to presentation, following the extraction of the third upper molar of the right side. The patch had since spread, ameliorating sporadically but never disappearing entirely, until it caused marked edema of both cheeks, both eyelids and the forehead, particularly on the right side. The lesions on the right cheek were fairly well marginated, red, shiny, irregular and showed some tendency to vesiculation. At first glance, it suggested an acute erysipelas. There were no subjective sensations, except tenseness of the skin. Roentgen examination showed cloudiness of the right antrum and frontal sinus. Drainage of the antrum did not have any permanent effect on the edema. A tentative diagnosis of cavernous sinus thrombophlebitis was made by the dental surgeon. Cultures were not taken.

DISCUSSION

DR. ABRAMOWITZ: I have had four patients in whom solid edema was located in various places; two around the eyes, one on the upper lip and one on the index finger. I succeeded in finding streptococci in the edema on the lip. Some of these patients give a history of erysipelas; some give a history, as in this patient, not of erysipelas but of an infection secondary to an infected sinus or an infected tooth. Patients have been helped by injections of streptococcus vaccine and at the same time fractional doses of superficial roentgen therapy. We have given as many as fourteen or fifteen such doses, also draining any infected sinus, infected tooth or any other focus discovered. Considerable reduction in the amount of swelling ensued with prolonged remissions between the attacks. I would make that suggestion in this case.

DR. CANNON: I suggest that you puncture the inflammatory area and make cultures of the serum withdrawn. In similar instances we have grown pure cultures of streptococci from the serum. In addition to giving autogenous vaccines, I advocate exposures with ultraviolet rays. I think that this form of treatment has proved more beneficial than any other I have tried.

DR. MALONEY: We are anxious to obtain a diagnosis of this case. I have seen the condition only once. I think it is an extension of an infection in the teeth. About a year ago we had a case similar to this, which followed the removal of a tooth in the same way and which developed solid edematous swelling in both cheeks. We used the grenz rays instead of the roentgen rays and obtained some benefit. This patient has been in Bellevue Hospital and was seen there by Dr. Symmers; he has received a number of injections of anti-erysipelas serum. The serum had no effect on the condition; the antrum was opened and drained, also without effect.

GUMMA OF CLAVICULO-ACROMIAL REGION. Presented by DR. MCCAFFERTY.

B. G., a man, aged 27, a waiter, born in Italy, presented himself at the Polyclinic Hospital, on the service of Dr. Dillingham, one month previous to presentation. He had a swelling with erythema over the right sternoclavicular process and another over the claviculo-acromial process. The Wassermann reaction was 4 plus.

LYMPHOSARCOMA. Presented by DR. ELLER.

W. C., a man, aged 50, born in the United States, reported at the Skin Clinic of the New York Post-Graduate Medical School and Hospital on June 29, 1928, having been referred from Dr. MacKee's office. He said that twelve years previously a small lump had appeared on his chin, which had become slightly larger and more tender. After several years it had disappeared and then gradually returned about five or six years prior to presentation. Three years previous to presentation the patient had been given treatment with mercury, arsphenamine and bismuth, which appeared to have diminished the size of the tumor so that

about one and a half years later a slight plastic operation was performed which practically removed all signs of the lesion. About one month after the operation the tumor again began to grow until it reached the size of a fist.

On examination a hard lesion made up of smaller nodules was found on the chin. It was freely movable and almost painless. The skin over the lesion showed dilated blood vessels and was purplish red. There was no ulceration. On the left side of the neck there was a gland the size of a walnut. The patient had a penile chancre in 1905, followed by a secondary manifestation. He had had four injections of arsphenamine. The last Wassermann test had been taken two years prior to presentation and was reported as negative. The Wassermann reaction of July 2, 1928, was reported as 4 plus. The tumor was removed by surgical diathermy on July 2. The patient had deep roentgen therapy four days after the operation. The histology was that of lymphosarcoma.

DISCUSSION

DR. MALONEY: To me this seems an interesting case and one in which apparently good results were obtained from treatment by endothermy. We have a history of definitely proved syphilis about twenty-three years in duration, followed twelve years after the primary lesion by gumma, which apparently disappeared under treatment and a year, or a year and a half ago by the development of a hard tumor. I do not know whether or not sarcoma ever develops on a syphilitic base, but one does see carcinoma on a syphilitic base. I wish to congratulate Dr. Eller on the apparent good result he obtained from the use of endothermy in this case.

DR. POLLITZER: I was struck with the remark that this tumor, which is sarcoma, developed on a syphilitic base. A sequence of this kind is rare indeed. Was the original growth really a gumma? Did it disappear entirely under treatment to be subsequently followed by sarcoma? I should like to know what the evidence is on which the diagnosis of gumma was based. Did it resemble gumma and really disappear completely under treatment? That it improved under syphilitic treatment is not enough to prove that it was a syphilitic growth.

DR. ELLER: This case is not presented as a cure but just as an interesting condition which had received certain treatments with apparent success to date. One cannot talk about a cure for three, four or five years. Radical surgical removal was done, and this was followed with deep roentgen therapy. More irradiation as a prophylactic measure will be given both to the chin and to the neck, and it is hoped that we will be able to report the results in the future. Dr. MacKee, who first saw the patient, states that the lesion did not disappear under intensive antisyphilitic treatment administered by the family physician; it simply improved and again became larger while the treatment was being given. In his opinion, the lesion was lymphosarcoma from the beginning and was entirely independent of the syphilitic infection.

DR. FELDMAN: The experience with lymphosarcoma is that they are so radiosensitive that there is no need for surgical intervention. This tumor will return just the same as will a tumor treated with the roentgen rays. I had one patient who recently died, who lived seventeen years with lymphosarcoma secondary to tuberculous adenitis. This tumor was treated with the roentgen rays and disappeared after every intensive treatment but recurred several times.

DR. FRASER: I am opposed to the statement that all lymphosarcomas are radiosensitive. Some cases of lymphosarcoma have proved to be resistant to radium or the roentgen rays.

ALOPECIA AREATA TREATED WITH THALLIUM ACETATE. Presented by DR. ABRAMOWITZ.

C. M., a boy, aged 5 years, born in the United States, of Italian parentage, from the Post-Graduate Skin Clinic, began to lose his hair about one year prior to presentation, but the scalp had become absolutely bald about seven months

prior to presentation. He had received doses of thallium acetate on June 27, 1928, the dosage being 3 mg. per kilogram of body weight. Five days later he had a slight rise in temperature and some pain in the abdomen, but these lasted only a few days and the child was perfectly well thereafter. Three weeks after the administration of the drug, the hair was noticed to be growing on the scalp, and at the time of presentation was growing profusely, but still showed many bald patches.

DISCUSSION

DR. ABRAMOWITZ: Every one seems to associate the action of thallium acetate with causing hair to fall out, not to grow. My experience with this patient is not original with me. There is some mention in the literature that children with alopecia areata had the hair return rather rapidly after a small dose of thallium acetate. I gave this patient 3 mg. per kilogram of body weight. Strange to say that even with this small dose the child was sick, a further warning that the drug must be used with a great deal of care. It has been noted that after thallium depilation there is a rapid regrowth, much more so than after the use of the roentgen rays. It may be possible to explain some of the mysteries of hair growth through the action of this drug.

LICHEN PLANUS. Presented by DR. ELLER.

R. F., a girl, aged 18, born in Russia, called at the Skin Clinic of the New York Post-Graduate Hospital on May 18, 1928, and said that one year previously she had first noticed an eruption on her face. On examination, many small ulcerations were found on the vermilion border of the lower lip. On the upper lip, extending half way to the nose, there was marked swelling and some crusting. At the inner canthus of both eyes there were erythematous scaly lesions. On the rest of the face there were a few papules. There were neither vulvar nor anal lesions. There were three or four whitish papular lesions on the mucous membrane of the left cheek. She had several small, flat, shiny papules, the size of a pea, on the thumb of the right hand. The biopsy taken from the lesion on the thumb revealed lichen planus. She received ten injections of a preparation of arsenic and mercury, with little improvement. From July 9, to Sept. 10, 1928, she received fourteen injections of gold and sodium thiosulphate, with marked improvement.

LUPUS ERYTHEMATOSUS OF THE LIPS. Presented by DR. MCCAFFERTY.

M. R., a woman, aged 42, a housewife, born in Italy, presented herself at the polyclinic Hospital on the Service of Dr. Dillingham in May, 1928. She received injections of a gold compound, with some improvement. She was later given doses of 4 amino-2 auro-thiophenol carbolic acid, but the improvement was not progressive; in fact, she became a little worse, one new lesion having appeared on the forehead. The lips were extremely dry and covered with adherent scabs. There was some atrophy and the eruption was sharply marginated.

DISCUSSION

DR. BECHET: I agree with the diagnosis of Dr. McCafferty's case; the patient has the adherent scales, central atrophy and sharply outlined edges so characteristic of lupus erythematosus of the lip. It is an interesting fact that lupus erythematosus is not infrequently located on the lip alone, and almost always on the lower lip.

Dr. Eller's patient came to my service at the Skin and Cancer Hospital some time before going to the Post-Graduate Hospital. At that time, her lips were swollen, edematous and covered with crusts. There was also exudation. The diagnosis of cheilitis exfoliativa was considered most plausible; I still think this diagnosis should be favored. I should certainly eliminate both lupus erythematosus and lichen planus, so far as the eruption on the lips is concerned.

DR. SCHWEIG: I saw Dr. McCafferty's patient four years ago. At that time I made a diagnosis of lupus erythematosus, and now the diagnosis is definitely

established. At that time the lesion was confined to the vermilion border of the lower lip and I could see only dryness and scaliness with beginning atrophy. The beginning atrophy of the lip suggested lupus erythematosus and I placed her on treatment with quinine-iodine. She could not tolerate quinine, so the doses were discontinued. Then I suggested gold therapy, but she refused to take it.

DR. MCCAFFERTY: There are a few points of interest regarding my patient. While the patient was being treated for lupus erythematosus of the lips she developed a lesion of lupus erythematosus on the forehead. In the beginning we treated this patient with a gold compound during which time the condition on the lips partly cleared. She remained away from the clinic for a short time and when she returned the lupus erythematosus of the lips had recurred. We then decided to try treatment with 4-amino-2 auro-thiophenol carbolic acid during which the lesion on the forehead developed.

As regards Dr. Bechet's statement that lupus erythematosus more frequently appears on the lower lip, I think this is generally true. I had a patient with a similar case of lupus erythematosus only on the lower lip, which cleared up entirely with a compound of gold. It is not always easy to make a definite diagnosis of lupus erythematosus of the lips. It simulates fairly closely cheilitis glandularis. There is one point of differential diagnosis which I have observed; the disease process extends beyond the vermilion border of the lower lip, involving the true skin, thereby making a wavy, irregular and occasionally atrophic line. This, of course, is not observed in the earliest lesions of lupus erythematosus, but after the disease has been present for some time.

XANTHOMA TUBEROSUM MULTIPLEX. Presented by DR. TRAUB.

D. L., a man, aged 22, a printer, born in Russia, had an eruption which had first appeared on the forehead and face and for a long time had remained confined to that location. The eruption disappeared as a result of roentgen treatment in 1926. The patient returned with a generalized eruption which was greatly improved under roentgen treatment. The results of examinations on the urine and blood were negative. At the time of presentation the patient showed lesions in the mouth.

DISCUSSION

DR. POLLITZER: Lesions of xanthoma tuberosum on the face are extremely rare. Were the lesions on the face of the usual type?

DR. TRAUB: The lesions on the forehead and sides of the face were exactly like those on the body; discrete, little nodules.

DR. CANNON: I think that this is an unusually interesting case because of the location of the lesions of xanthoma on the face and mucous membranes of the mouth. Most of us will probably recall the patient of Dr. Whitehouse who had large tumors over the face and mucous membranes of the mouth as well as on other parts of the cutaneous surface. The diagnosis was finally made by Professor Arndt of Berlin and Artz of Vienna by sections removed from the tumors. I had the opportunity of observing the patient both at the Vanderbilt Clinic and at Professor Arndt's clinic in Vienna. He was treated at the latter institution with a preparation of iodine which was injected directly into the tumors as well as given by mouth. The tumors became greatly reduced in size by this treatment. Filtered and unfiltered doses of radium had failed to cause any change in the condition.

DR. WILLIAMS: This man was on my service at the Skin and Cancer Hospital. I injected iodipin, 10 per cent, into the tumors; it was distinctly painful and without benefit. I also tried starvation, basing the treatment on the work of Udo Wile. There was no absorption of the tumors; the only treatment we found effective was destruction of the lesions by some mechanical means, such as electroylisis or the roentgen rays. The roentgen rays have produced marked benefit whenever tried.

DR. WOLF: It might be well to recall a case presented by Dr. Ochs seven or eight years ago, that of a child about 4 years of age, who had a most extensive xanthoma tuberosum. The crux of the situation at that time was the question of therapy. To our great surprise we heard later that the child was cured by palladium, a homeopathic remedy. The patient had lesions of the mucous membranes.

DR. BERKOWITZ: This particular child was shown by Dr. Ochs for me and presented lesions on the gum, along the side of the teeth, involving all of the gum tissue in front of the mouth. As far as palladium goes, I do not claim the credit for that; Dr. Mount of Albany suggested it to me. The patient received palladium three times over a period of nine months, and at the end of that time the condition entirely cleared up.

DR. LAPOWSKI: I can report cases of xanthoma in children which cleared up in a year without any treatment.

DR. TRAUB: These cases are perhaps more frequently encountered than one would expect from the literature. At Philadelphia last December, there were three cases just like the one presented. The patients had received various types of treatment. In two cases, I tried palladium four times and did not see any improvement. Dr. Williams said he used iodized oil 10 per cent in this particular case, with good results. Dr. Howard Fox, I believe, has been interested in this type of case lately. There are apparently two types. He is interested in trying to discover whether some conditions clear up entirely spontaneously on reaching a certain age. In this case, the striking thing was the response of the lesions on the forehead to treatment. The patient received one-half erythema dose, unfiltered, a total of four and one-half skin units, in 1926, on the forehead and side of the face which are now practically free from lesions. We are just beginning to treat the body with the roentgen rays, with one-half skin unit doses.

GRANULOMA INGUINALE. Presented by DR. SAUNDERS.

J. W., a man, aged 38, presented himself at the clinic on March 28, 1928, with a history of having had a sore on the penis for two years. He had received twenty injections of tartar emetic; twenty-five treatments with some form of arsphenamine, and fifty intramuscular injections; he also received seven roentgen treatments. He presented a serpiginous ulceration around the glans and prepuce, varying from 1 to 2 cm. in width, with well defined, slightly raised borders. There was a seropurulent discharge. The Wassermann reaction was negative. Smears were likewise negative for Donovan bodies. The biopsy was done in the Skin Department of the Post-Graduate Hospital and showed chronic granulation tissue. He received three injections of tartar emetic at the Department of Dermatology, New York University, the first on March 28, the second on September 19, and the third on Oct. 3, 1928. When seen on the day of presentation the lesions had extended.

PEMPHIGUS. Presented by DR. MCCAFFERTY.

J. H., a woman, aged 37, a housewife, born in Poland, presented herself at the Polyclinic Hospital, service of Dr. Dillingham, in March, 1927. At that time, the patient had bullous lesions on the roof of the mouth and on the body, especially on the aural and genital regions. She was given arsenic by mouth and one blood transfusion. The condition cleared up entirely in five weeks, and there had not been a recurrence for four and one-half weeks.

ANGIOMA OF UNUSUAL EXTENT. Presented by DR. BECHET.

J. R., a girl, aged 13, said that the lesion had been present since birth; on inspection she presented a large cavernous angioma on the right leg, extending from above the crest of the ilium to the end of the toes. The entire hip, thigh, leg and foot were involved. The lesion was dark brown, and contained many

tortuous veins, some of which had been removed a year previously, leaving some unsightly scars. The entire limb had atrophied considerably, its circumference being considerably less than that of the normal leg.

VINCENT'S ANGINA. Presented by DR. ELLER.

J. F., a man, aged 48, born in Poland, came to the Post-Graduate Skin Clinic on Aug. 8, 1928. Six months previously he had noticed sores in the mouth. On the roof of the mouth there were many ulcerated lesions the size of a pea; there were also milky white patches on the buccal mucous membrane. The gums were bluish red. Smears showed the presence of Vincent's spirilli and fusiform bacilli. They were also demonstrated under the dark-field microscope. Since Aug. 20, 1928, he had received local treatments with a 10 per cent solution of neoarsphenamine and had markedly improved.

MARKED SCARRING FROM SYPHILIS. Presented by DR. CORNELL.

L. L., a woman, aged 52, a housewife, born in the United States, came to the Skin Clinic of the New York Post-Graduate Hospital on June 1, 1928, with an eruption of four years' duration. She said that four years previously she had had an abscess on the inside of the nose. Soon afterward an ulcer appeared on the skin near the nose. She presented herself at the Skin Clinic on June 1, showing an extensive serpiginous area covering the nose and parts of both cheeks. The border of the area was 1 cm. wide and consisted of thick crusts with exudation. Within this area there was extensive scarring and atrophy. The nose was flattened and deformed. There was an absence of the uvula and part of the soft palate. The Wassermann reaction was positive.

EPIDERMOLYSIS BULLOSA HEREDITARIA. Presented by DR. BECHET.

M. S., a girl, aged 2 years, presented for examination a number of bullae, chiefly over the hands, elbows and knees. Her mother said that they had been present for one and a half years, and were always preceded by slight traumatism. The slightest fall brought on the lesions, and the patient had never been free from them since the age of 6 months. Her general health was good. There were no lesions on the parts of the body protected from trauma.

Regular Meeting, November, 1928

ERYTHEMA MULTIFORME PERSTANS. Presented by DR. CHARGIN.

D. A., an Italian, aged 41, married, a bookkeeper, whose health had always been good, said that eight months previously he had noticed several red spots around his right eye, on the chest and on the arms. The lesions were round and raised and they itched slightly. During the following two months new lesions appeared on the body, but they were comparatively few totaling not more than twenty-five. On the advice of friends the patient took natural sun baths during the entire month of August. After exposure to the sun a great many new lesions appeared, chiefly in the areas exposed to the sun which were moderately sunburned. When the patient was seen by his physician, the fresh lesions were found to be red, flat, solid papules. As time progressed, these increased by peripheral extension sinking in the center at the same time. In that way the rings were formed. The rings by confluence produced gyrate figures with depressed centers and raised borders. At that time a bullous eruption appeared in the mouth especially on the lips, and some of the lesions on the body showed bullae at their centers. One year prior to presentation the patient had his appendix removed following an attack of appendicitis. The patient said that he had not had any venereal disease or any former skin trouble.

At the time of presentation the eruption was most marked on the chest, back, arms and legs. The eruption was mostly of two types: (1) psoriasiform patches of varying sizes and shapes, and (2) remains of former eruption in the form of pigmented and red areas giving the skin in those locations a mottled appearance. The psoriasiform eruption showed a raised border and was serpiginous in outline. It was especially marked on the back. There were numerous fresh lesions, isolated and papular. The process was less active during the last few weeks before presentation. Subjectively, there was a moderate amount of itching.

The Wassermann test was negative; the urine showed a faint trace of albumin and a few hyaline casts; a blood count done in September showed 4,100 white cells with a relative lymphocytosis (52 per cent). An examination of the blood on November 3 showed 7,600 cells and a practically normal differential count.

DISCUSSION

DR. POLLITZER: In my opinion this case is one of mycosis fungoides. The slightly infiltrated, red, itchy patches with bizarre and fantastic outlines seem to me to bear the impress of mycosis fungoides. A case of this kind ought to be studied much more thoroughly than is possible in the few minutes at our disposal. I offer the diagnosis of mycosis fungoides tentatively, but with considerable confidence.

DR. CHARGIN: The reason that this case was not presented as one of mycosis fungoides is because of the presence of the bullous lesions, particularly the lesions in the mouth. This case resembles one that I presented before this society several years ago; the patient has since died of mycosis fungoides. That patient showed figured lesions over the body but at no time bullous lesions. A case similar to the one presented tonight was described by Darier. His patient, however, was a much younger person. Darier stated that his patient recovered and remained well thirty-one years thereafter. The biopsy, while suggestive of mycosis fungoides, was by no means conclusive.

DR. LAPOWSKI: The presence of bullae is not against the diagnosis of mycosis fungoides. Ten or fifteen years ago I saw a patient at the Polyclinic Hospital, and my first diagnosis was contagious impetigo. The condition was later diagnosed at Mt. Sinai Hospital as mycosis fungoides. After a while the lesions developed into infiltrated patches, but in the beginning they were bullae.

DR. GOLDENBERG: I agree with the diagnosis of Dr. Pollitzer and with the statement of Dr. Lapowski that the presence of bullae does not exclude mycosis fungoides. The patient shows a polymorphous eruption, resembling lichen planus, erythema gyratum and eczema which is probably the premycotic stage of mycosis fungoides.

A CASE FOR DIAGNOSIS (TUBERCULOSIS?). Presented by DR. CHARGIN.

S. F., a man, aged 38, married, Russian by birth, a tailor, admitted an attack of gonorrhea many years before the present illness. His general health had been good. He said that he had not had syphilis.

His skin condition had first appeared about six months prior to presentation. He had then noticed "lumps," first on the arms and then on the legs. They were deep-seated nodules, reddish and slightly painful. As time progressed, the lesions had increased to the size of a pea or perhaps a little larger. New lesions also appeared, always as deep-seated nodules. They were isolated or several appeared grouped, for example, on the leg. In the course of time, some ulcerated spontaneously. A number had been treated with a caustic by the patient's family physician, but this served only to irritate the margins of the ulcers, giving the lesions the aspect of gumma.

When presented, the patient showed isolated and conglomerated lesions in the various stages of evolution and involution. On the arms there were a few lesions which were regressing. The lower third of the right leg showed most of the lesions; here they had a serpiginous arrangement, with ulceration. A few isolated

fresh lesions, deep-seated and slightly sensitive were noted; some of these showed psoriasiform scales. When first seen there appeared to be periostitis of the leg, but the results of the roentgen examination were negative. The Wassermann test proved to be negative. The blood showed 9,000 white cells with a normal differential count. The urine was normal. Because of the possibility of bromoderma the urine was examined for bromine with negative results. The patient said that he had not taken bromides. The histologic examination was not conclusive. Because of the possibility of syphilis the patient had received several injections of bismuth and one of neoarsphenamine, but the condition did not improve.

DISCUSSION

DR. POLLITZER: My impression was that this is a case of tuberculosis of the skin, a subcutaneous infection from some systemic focus. The lesions have developed slowly; they may be felt under the surface for some time before ulcerating.

DR. CANNON: The duration of the ulceration and its punched-out appearance are suggestive of syphilis to me. I suggest continuing the antisyphilitic treatment and repeated Wassermann tests.

DR. SATENSTEIN: I cannot suggest a clinical diagnosis or establish a histologic diagnosis from the tissue submitted for examination. Deep tuberculosis is characterized by the presence of tubercles in addition to inflammatory reaction and granulation tissue. These observations are not present in the specimens. The only way to confirm the clinical diagnosis of possible tuberculosis is either by animal inoculation or by the demonstration of the tubercle bacillus.

LICHEN NITIDUS. Presented by DR. RULISON.

A. S., a white woman, aged 21, unmarried, a native of Sweden, had a negative family history. She had never been seriously ill. Physical examination revealed no abnormality, aside from the condition of the skin, with the exception of a moderate constipation and a slight anemia (hemoglobin 76 per cent, red blood cells, 4,110,000). For one year prior to presentation the patient had noticed the eruption, which had not caused any sensory disturbance. The eruption consisted of patches, oval or irregular in outline, having an average diameter of 5 cm., located on the anterior surface of the right wrist, the right antecubital fossa, the sternal region and the left side of the thorax. The individual lesions were skin colored papules, the size of a pinhead, slightly umbilicated and having glistening flat tops. A biopsy had been made from an area on the right forearm, on October 29. The histologic examination was made by Dr. Fraser who reported observations typical of lichen nitidus.

LICHEN SCROFULOSORUM. Presented by DR. MALONEY.

M. F., a boy, aged 8, born in the United States, presented a condition consisting of five or six coin-shaped patches of papules, ranging in size from that of a ten cent piece to that of a half dollar, which began about the middle of the right arm and extended down the flexor surface of the forearm to the wrist. The patches consisted of numerous discrete, small, glistening, brown papules, the size of a pinhead, most of which were topped with a tiny scale. Interspersed among them were numerous satellite papules. There was no tendency for the papules to become confluent. Erythema or itching had not occurred. The papules were situated in large numbers on the posterior surface of the neck and spread toward the front, over the clavicular region and over the upper scapulae. The chest and abdomen were free from the infection except for a single papule here and there. The back, between the levels of the lower thoracic and lumbar vertebrae, was clear. On the left and right buttocks, over both groins and the inner aspect of both thighs, a fine, papular, slightly scaly rash was noted. Over the patella were numerous yellowish brown papules, slightly larger in size. The lesions began again on the anterior or tibial surfaces of the legs and dorsum of both feet and occurred in patches, the size of a

ten cent piece. The scalp, face, scrotum, palms and plantar surfaces were free from lesions. Roentgen examination of the lungs showed an exaggeration of the markings throughout both lungs, with peribronchial infiltration more marked at the roots. There was no evidence of fluid in either thoracic cavity. The apexes were clear. Histologic examination showed a picture of lichen scrofulosorum. The patient received seven injections of gold and sodium thiosulphate totaling 120 mg., and showed slight improvement.

DISCUSSION

DR. GOLDENBERG: I think this is a case of lichen nitidus.

DR. ANDREWS: I am inclined to agree with the diagnosis of lichen nitidus. There are definite linear lesions, one on the forearm, which are not observed in lichen scrofulosorum. The absence of lesions on the abdomen and their situation on the extremities are against the diagnosis of lichen scrofulosorum.

DR. SCHEER: I was impressed, as were the previous speakers. The lesions are pinpoint in size and definitely shiny in character, such as one expects to find in lichen nitidus. I did not see any of the scaly lesions that are common in lichen scrofulosorum.

DR. ABRAMOWITZ: I had occasion to see this patient at my skin clinic at the Israel-Zion Hospital in Brooklyn. Lichen nitidus was excluded as the papules were somewhat inflammatory, slightly scaly and of extensive distribution. They, therefore, conform to the clinical picture of lichen scrofulosorum.

DR. FRASER: My experience has been so limited with these conditions that anything I might say should not be taken as authoritative. The microscopic pictures certainly differ. In the slide of Dr. Rulison's patient there is a localized circumscribed and superficial infiltration which is the picture of lichen nitidus. In the second case, the reaction seems to be confined to the appendages, especially the follicles, and this I understand to be the distribution which is characteristic of lichen scrofulosorum.

DR. MALONEY: We considered this a case of lichen scrofulosorum. The papules in this case are not like lichen nitidus. They are slightly elevated above the skin, and those of lichen nitidus are level with the skin. The color of the patches in this case is yellowish; the color in the papule of lichen nitidus is that of the skin or slightly lighter. Grouping in this case is somewhat different from that in lichen nitidus. The papules in lichen nitidus are distinctly discrete; in this case, they are so close together they apparently run together. Dr. Highman made the original histologic examination in this case. He has examined a good many cases of lichen nitidus and lichen scrofulosorum, and he made a definite diagnosis of lichen scrofulosorum.

ACNE VARIOLIFORMIS. Presented by DR. SPIEGEL.

A. C., aged 54, a native of Poland, a tailor, was presented because of a skin eruption which had been present at intervals for eight years, and which had been accompanied by considerable itching. Examination showed a discrete erythematous, slightly elevated, papulopustular eruption, with papules varying in size from that of a pin to that of a pea over the entire scalp, forehead and temples. Some of the lesions were umbilicated, and there were numerous scars from old lesions.

The biopsy report was as follows: The main feature of the epidermis in the section was the break in the line due to ulceration. The rete on each side of the ulcer was thickened and covered by a scale. The corium was edematous. There were several hair follicles and their attending sweat glands. The glandular structures showed inflammatory change noted by a general infiltration. The ulcer was just beside a hair follicle, and the infiltration adjacent was moderately dense. The floor was made up of densely infiltrated corium adjacent to a gland. The infiltration consisted of deeply stained fibroblasts and round cells and lighter stained epithelioid cells. The central parts of the infiltrated areas showed epithelioid cells in ratio of two to one, whereas the outer parts showed fibroblasts and round cells in a ratio of about four to one. Some of the areas also showed

giant cells in the central part of the infiltrated areas. There were no special changes in the blood vessels reported.

DISCUSSION

DR. SCHEER: Clinically, the lesions in this case are acne varioliformis. The histologic observations in the case would support the views of those who place acne varioliformis in the group of tuberculids.

DR. MALONEY: The fact that the histologic examination shows the picture of papulonecrotic tuberculoid does not, I think, rule out the diagnosis of acne varioliformis. Acne varioliformis is merely a name applied to papulonecrotic tuberculid of the scalp and forehead. Histologic examination is about the same in both.

DR. GROSS: Acne necrotica or varioliformis has absolutely no relationship to tuberculosis.

DR. BLOOM: Of course, it is a typical case of acne varioliformis. As to the histology, I heard Dr. Highman say that there is no difference between the picture of acne varioliformis and papulonecrotic tuberculid.

DR. CHARGIN: I agree with the diagnosis of acne varioliformis. It is interesting to note that Kyrle, in his book, includes acne varioliformis in the chronic specific-inflammatory skin reactions and argues in favor of including this disease in the group of tuberculous conditions of the skin. For a number of years we, in the United States, have looked on the disease as atypical of local infection, bearing no relation to tuberculosis.

LUPUS FOLLICULARIS DISSEMINATUS FACIEI. Presented by DR. GROSS.

D. L., a white man, aged 25 years, born in the United States, had an eruption which began about a year previously on the upper lip, spreading rapidly over the face. Roentgen treatment had failed to effect much improvement. There had been some improvement during the administration of arsphenamine. The Wassermann reaction was negative.

At the time of presentation the clinical observations were: on the face there were rather symmetrically distributed papulopustular lesions which were a definite brownish pink. On the lids of the right eye were small nodules of a yellowish pink. On the ear lobes were a number of firm papules, practically the color of the surrounding skin. There were a number of superficial scars and pigmentations. On the penis shaft was a pea-sized, pinkish nodule of firm consistency. The roentgenologic observations of the chest were: both apexes obscured by a fibrotic and pleural thickening consecutive to an old, probably arrested tuberculous process. Both hilums showed calcified glands. Fresh parenchymatous lesions were not found. The heart was normal in size and configuration. Blood pressure was 120 systolic and 68 diastolic. A biopsy was taken from the left side of the chin on February 8 and showed a normal epidermis, a slight lymphocytic infiltration of the corium—chiefly about the small vessels—and a group of giant cells beside one of the sebaceous glands. The picture could have been interpreted as acne.

The second biopsy, taken from the left temporal region on March 5, showed a minute discrete granuloma occupying the upper half of the corium containing groups of epithelioid cells, several giant cells and an edematous stroma thickly infiltrated with lymphocytes. The epidermis was slightly thinned: a typical miliary lupus.

From February 16 to April 25, the patient received eleven injections of a gold compound (765 mg.) of which the last six were doses of 100 mg. Since there was only slight improvement, general ultraviolet ray treatments were given until the middle of June. Locally, some of the lesions were treated with a fine desiccation spark or bipolar electrocoagulation. The patient was then advised to go to the mountains and take general sun baths. When he returned in the fall there was a marked improvement. There were still some small nodules present and residual infiltrations in some of the scars, but the improvement was evident by comparison with the photograph taken in February, 1928.

DISCUSSION

DR. LAPOWSKI: I saw this patient about five months ago. The lesions on the face were exactly as they appear now, and there were some lesions on the penis. There were some discolorations on both tonsils but no mucous patches. I treated him with arsphenamine, and while the lesions did not disappear, they did improve. The diagnosis of lupus erythematosus in this case requires the demonstration of the presence of tubercle bacilli.

DR. BECHET: I think the lesions on the face are characteristic of the disseminate type of lupus vulgaris. There is atrophy in the center, necrotic scarring and small nodules. It seems to me the ordinary type of disseminate lupus vulgaris of the small nodular type, as described by Tilbury Fox.

DR. GROSS: Dr. Satenstein, who just examined the section, agreed with the diagnosis of miliary lupus. I do not know what the lesion on the penis is; the rest of the body is free from lesions. As to the effect of the administration of arsphenamine in this case, I do not think it speaks against the diagnosis of tuberculosis. Papulonecrotic tuberculids, erythema induratum, sarcoid and similar conditions frequently respond to treatment with neoarsphenamine. Although I believe that the absolutely typical microscopic observations are sufficient proof of the diagnosis, I shall attempt animal inoculation.

LUPUS VULGARIS WITH PULMONARY TUBERCULOSIS. Presented by DR. MCCAFFERTY.

L. T., aged 17, born in Italy, presented through the courtesy of Dr. F. J. Altschul, had moderately advanced pulmonary tuberculosis with sputum which gave a positive reaction. She also had tuberculous cervical adenitis without sinus formation. One gland had been excised, and the microscopic examination showed tuberculosis. Both the pulmonary and the glandular tuberculosis antedated the condition of the skin which began about two years prior to presentation. At first there was a reddish brown nodule on the left ala nasi. In the course of several months, new nodules developed on the left lower portion of the nose and inside of the left nostril. Several similar lesions developed later along the under surface of the chin and along the left portion of the jaw.

SARCOID (BOECK). Presented by DR. ANDREWS.

A. K., a white woman aged 30, born in the United States, gave a history of having five years previously first noted a small tumor on the left cheek. Two years later similar tumors had begun appearing on the extremities. A few months before presentation one had appeared on the nose.

A biopsy was taken on Nov. 27, 1926, from a nodule in the crural region. The epidermis was normal. In the subcutaneous tissue were masses of closely packed epithelioid cells, many of which were arranged in typical tubercle formation. There were no giant cells and no caseation necrosis was present. The connective tissue fibers were swollen and hyaline in appearance. There were no acid fast bacilli (Ziehl Nielson).

Generalized ultraviolet light, x-rays both filtered and unfiltered, tuberculin and 4 amino-2 auro thiophenol carbonic acid had been given without benefit.

When presented there was, in the left malar region, a bluish-red tumor, 2 by 1 cm. in size, sharply defined and firm in consistency. Diascopy showed a number of brownish, superficial nodules. The tip of the nose showed a similar lesion 2 cm. in diameter. The extensors of the arms showed about ten plaquelike lesions from 2 to 5 cm. in diameter; these were well defined, from a bluish-red to a brownish-red and of hard consistency. The smaller lesions were cutaneous, while the larger ones involved the subcutaneous tissue. Diascopy showed brownish-yellow color only. There were a number of small superficial lesions on the legs, similar to those already described but much less infiltrated.

ERYTHEMA INDURATUM TREATED WITH GOLD. Presented by DR. BECHET.

S. W., a woman, aged 24, first entered the clinic on Nov. 20, 1926, for relief from a papulonecrotic tuberculid of the fingers and hands, and erythema induratum of the legs. The lesions had been present for several years, and were unusually numerous and extensive. There were at least a dozen lesions on both hands. The lower part of the legs was covered with several large indurated patches of Bazin's disease, some of which had ulcerated. Between No. 20, 1926, and May 14, 1927, the patient received twenty-six injections of gold and sodium thiosulphate in doses of 100 mg. The improvement from the first was exceedingly rapid; the lesions disappeared entirely after the twentieth injection. From May 14, 1927, on the patient remained entirely well. The case proved that the disappearance of the lesions after the administration of gold compounds was permanent; for in this case the patient remained well for eighteen months without treatment.

DISCUSSION

DR. FEIT: I treated several patients with tuberculids with arsphenamine tuberculin and general hygienic measures with poor results, but they responded well to treatment with gold compounds. A patient with tuberculous axillary adenitis remained cured for nearly one year.

DR. ABRAMOWITZ: I presented an unusually severe case of Bazin's disease last year that was cured with injections of gold and sodium thiosulphate, after practically every known method of treatment had proved unsuccessful. This patient developed new lesions this fall, in spite of the fact that she had received monthly injections of gold compounds since she was cured. She is now receiving injections of gold, but they do not seem to check the further progress of the disease.

DR. HOPKINS: Dr. Rutledge, at the Vanderbilt Clinic, has had seven patients with erythema induratum under treatment with gold compounds. Our impression has been that they had done very well. On checking up, however, he found that only one of the seven had showed marked improvement; two showed definite improvement; one or two possibly slight improvement, and two none at all, which was rather discouraging.

GRANULOMA ANNULARE. Presented by DR. CHARGIN.

M. M., a man, aged 54, Russian by birth, married, a food handler, who had been in general good health, first noticed the skin disease on the dorsal aspect of both hands two years previous to presentation. At first a few lesions appeared and in the course of months gradually grew in extent as well as in number. Lesions appeared on the neck two months prior to presentation. The eruption was on the posterior aspect of both hands. The lesions were small nodules isolated or arranged in circles or segments of circles. Many became confluent, producing irregular, serpiginous patches of eruption. The center of the lesions was depressed and showed some pigmentation. When stretched, the lesions were typically white. On the neck the lesions were numerous, and, while irregularly arranged, showed numerous circles.

DISCUSSION

DR. LAPOWSKI: The patient exhibits lesions on other parts of the body; on the arms and on the lower extremities from the knees down, and there are pigmentation and shiny papules. On one sole one may see vesiculopapular lesions. On the mucous membranes of the left cheek are whitish spots. To me it is not granuloma but a form of lichen.

DR. HOWARD FOX: In my opinion this case is a classic example of granuloma annulare. Dr. Lapowski's remarks about resemblance to some form of lichen planus remind me of a most extraordinary case I recently saw in Dr. Goldenberg's service at Mt. Sinai Hospital. This eruption covered a considerable part of the body and presented ringed lesions which almost any dermatologist would have thought to be lichen planus. Histologically, it proved to be granuloma annulare.

DR. GOLDENBERG: I believe that this is a typical case of granuloma annulare. The lesions in the mouth and on the glans penis, which Dr. Lapowski claims to be present, I have not been able to see.

DR. GROSS: I would suggest to Dr. Chargin that he examine the sections of this remarkable case for tubercle bacilli. Klingmueller and Dittrich demonstrated tubercle bacilli in granuloma annulare by a modified Ziehl-Nielsen method.

DR. CHARGIN: This case recalls to memory a patient seen many years ago in the service of Dr. Lapowski, in whom a diagnosis of an unusual type of lichen planus was made. This case was later observed at the Mt. Sinai Clinic in the service of Dr. Goldenberg and recognized as granuloma annulare, which was confirmed by biopsy. The patient was presented at this society, and the diagnosis accepted.

The case presented this evening is identical and is, I believe, a typical case of granuloma annulare, bearing all the clinical features of that disease.

LUPUS MILIARIS DISSEMINATUS. Presented by DR. ROBINSON.

The patient was presented because of an eruption which first began as a small papule on the side of the nose in 1924. It gradually spread over the entire nose and formed groups of papules around the mouth and mucous membranes of the lips and sides of the cheek. In 1925, the patient was treated with endothermy, and the lesions spread at the borders of the treated areas. In 1926, similar lesions appeared on the neck, arms and legs. In December, 1927, the patient entered the Presbyterian Hospital with multiple groups of soft, brownish-red papules, the size of birdshot, which completely covered the nose and were scattered over the rest of the face. The lesions on the body were similar papules, but showed a tendency to form small crusts or necrotic areas.

In 1925, roentgen examination showed a marked substernal and peribronchial enlargement of the lymph nodes. Examination of the sputum was negative for tubercle bacillus. The Wassermann test was negative. Under treatment the patient's lesions subsided, and the general health improved. The patient received thirty doses of 0.015 Gm. of amino-auro thiophenol carbonic acid intravenously.

SYPHILITIC REINFECTION (THIRD TIME). Presented by DR. PAROUNAGIAN.

R. L., a man, aged 46, was first admitted to the Bellevue Hospital Syphilis Clinic on Nov. 9, 1921, and at that time presented a chancre on the lower lip, a generalized maculopapular eruption and general adenopathy. The Wassermann reaction was four plus. He had received eight injections of silver arsphenamine, six of arsphenamine, fifteen of mercuric chloride and fifteen of mercuric salicylate from Nov. 9, 1921, to Oct. 17, 1922. From Nov. 26, 1922, to Oct. 25, 1926, thirteen Wassermann tests were performed all of which were reported negative.

The second infection occurred on March 14, 1927. The patient returned for his periodic Wassermann examination which was reported four plus, and on examination a marked roseola, general adenopathy, a recently healed chancre on the prepuce, secondary lesions on the genitals and a history of exposure corresponding to the usual period of incubation were reported. The eruption had been present for two weeks. He was presented before the section of the Academy of Medicine on April 5, 1927, as a case of reinfection, and this diagnosis was accepted by the majority present.

He was given sixteen injections of neoarsphenamine and thirty of mercuric salicylate in two courses from April 5, 1927, to Jan. 10, 1928. He yielded to the treatment satisfactorily, and Wassermann examinations on the following dates were negative: Feb. 27, May 14 and Aug. 7, 1928. During that time he remained entirely free from lesions or symptoms.

The third infection occurred on Oct. 25, 1928, when he returned for a Wassermann test which was again reported four plus. The condition induced investigation which disclosed a profuse roseola and the recently healed, indurated remains of a penile chancre. The patient had been exposed about July 27, 1928. The genital

lesion had appeared about August 12 (five days after the last negative Wassermann test). The eruption had been present almost a week. He also showed palmar lesions.

DISCUSSION

DR. LAPOWSKI: If we pay attention to the present development of the pathology and immunology of syphilis, we must agree that superinfection is a possibility and occurs in experimental syphilis in animals.

DR. CANNON: I think that most of us believe primarily that an early secondary syphilis can be cured within a year if properly treated. I have seen, in association with Dr. Fordyce, a case in which we considered there had been three separate and distinct infections of syphilis. This patient had three initial lesions over a period of seven or eight years with enlargement of the regional inguinal glands and a secondary eruption with demonstration of the spirochetes in each chancre and a strongly positive Wassermann reaction of the blood serum. Following the diagnosis of syphilis in each instance, he was treated continuously for about one year. Repeated Wassermann tests of the blood and of the spinal fluid were negative for a year between each infection. With the last two infections the reaction of the blood remained negative after the development of the chancre until the appearance of secondary lesions. I think that Dr. Parounagian's case is probably one of reinfection.

DR. RULISON: If the possibility of reinfection is absolutely denied, it is rather difficult to account for the fact that most of this patient's lesions at the moment are frankly secondary. He had had, over a period of several years, a great deal of antisyphilitic treatment, which should at least have made the syphilitic manifestations tertiary.

DR. GROSS: I do not think that this discussion can settle anything since we know that it is theoretically impossible to prove the fact of a reinfection. If a tabetic person can be superinfected with syphilis, and a patient with negative reactions to tests on the blood and spinal fluid still may have clinical syphilis, one can only believe in reinfection but cannot convince anybody by logical arguments. Furthermore, I would like to have the definition of the word superinfection. Should this name not be reserved for the rare instances reported in the literature in which a patient with clinical or serologic syphilis (acquired or congenital) contracted a primary lesion? Reinfection is one thing, superinfection another and reinduration or re-erosion still another occurrence.

DR. THORNLEY: It would appear that most of our trouble here can be ascribed to having no definite rule for establishing a diagnosis of reinfection. It would be advantageous if some one should formulate a rule similar to that of Koch's for identifying a given bacteria with a certain disease. This would give a definite standard by which to measure results. It seems to be evident that one must be sure a patient had syphilis; one must prove that he has been cured, establishing that fact by means of repeated Wassermann tests of the blood and cerebrospinal fluid and by every other known method; finally, one must prove the reinfection.

Before we can prove a reinfection, we must know that the partner has syphilis and was in an infectious stage at the time of the supposed infection. This is essential.

Subsequent manifestations are on an entirely different plane. It is absolutely essential to establish the fact that the presumably cured patient has been exposed to syphilis in such a way that he may be supposed to have contracted it with reasonable certainty. Sexual intercourse with some unknown woman, prostitute or not, does not warrant such a conclusion beyond a reasonable doubt.

DR. PAROUNAGIAN: My conception of superinfection in syphilis is: a patient who has been insufficiently treated, in whom the Wassermann test may be positive, who may even have positive signs or symptoms of syphilis, and who, after sexual exposure, develops a new initial lesion on a different location than the original and manifests secondary lesions in the usual order. The interval between the first and second infection may be short or many years may elapse. I presented

before this section only recently a patient with a new chancre who had positive signs of tabes dorsalis.

With reinfection we have a much more difficult problem to handle as the diagnostic requirements are more exacting. One of the most convincing points is the fact that all three infections in the case presented were my observation.

DR. POLLITZER: In my opinion Dr. Parounagian has made out a good case for two reinfections.

IDIOPATHIC MULTIPLE HEMORRHAGIC SARCOMA. Presented by DR. COMBES.

S. F., a man, aged 64, born in southern Italy, gave a history of the onset of an eruption on his hands six months prior to presentation. It was immediately followed by a general metastasis. The family history was of no significance. He first came under observation three weeks prior to presentation, at which time he presented a generalized eruption of rounded and ovoid, flat, reddish-brown and violaceous nodules, varying in size from 0.5 to 0.3 cm., which in some locations, especially on the extremities, had coalesced to form plaques of varying size. The lesions numbered nearly 100 and were widely distributed. Minute telangiectases appeared on the surface of some. The hands, feet and face were elephantiasic. Nodules were also present on his ears, eyelids, cheeks and buccal membrane; the tip of his tongue was infiltrated, edematous and showed distinctly the impression of his teeth. All the lesions were firm to touch, some almost boardlike, and somewhat tender on pressure. There were no subjective symptoms other than a sensation of tenseness. Histologic examination showed the characteristic picture of idiopathic multiple hemorrhagic sarcoma of Kaposi.

DISCUSSION

DR. POLLITZER: The histologic picture was reported as being typical or characteristic; may I ask what the characteristic picture is?

DR. FRASER: The case is clinically typical of the condition described by Kaposi as multiple idiopathic pigmented sarcoma but histologically is not a true sarcoma. The picture here, as in all others that I have observed, represents an inflammatory rather than a neoplastic process. I feel, therefore, that this disease should not be classified as belonging in the sarcoma group.

I am not alone in this view. Sequeira has stated in the late edition of his textbook that histologically and clinically the condition should be removed from the sarcomas. From a recent conversation with Dr. Pollitzer, I gathered that he never did believe that the condition described by Kaposi was a true sarcoma.

I do not agree with the statement in the history that the lesions on the trunk and arms are metastatic. In my opinion the theory of multiple primary origin is more probable. If metastasis had occurred from the lesions on the hands, it should have taken the usual route by the lymph and blood stream, and there should be evidence of involvement of the internal organs.

DR. FEIT: A patient I presented here some time ago developed lesions first in the mouth and then on the legs; it looked far-fetched to me that they should be metastases, but as I have listened to Dr. Fraser's remarks, the lesions we see of Kaposi's sarcoma seem not to be metastases. Did this patient have the lesions in the mouth first or were they secondary to the others?

DR. COMBES: My reason for presenting this case was, in the first place, the comparative frequency of the disease; second, because of the generalized distribution of the tumors, and third, the rapid dissemination of the tumors after their first appearance. I said, in the history, that the metastases occurred shortly after the primary lesion. My reason for mentioning that dissemination as metastasis was because others, and Kaposi himself, used the term to describe the spread of the disease following the initial tumor. This case, I think, illustrates well the point Dr. Fraser has brought out, that the multiple lesions are not metastases of the primary lesion, but are evidently due to some systemic disease of unknown etiology. I agree with Dr. Fraser regarding the nonsarcomatous nature of the disease. I believe Gilchrist and Ketron described it as an angioma; as the vessels have fragile

walls, and become snared off by connective tissue bands such as occurs in some other malignant growths in the skin. The infiltration is secondary and inflammatory, not sarcomatous in nature. In answer to Dr. Feit's question, the lesion on the tongue was secondary and only of recent occurrence.

PEMPHIGUS (?). Presented by DR. HOPKINS.

P. M., a white man, aged 62, born in the United States, a plumber, said that one year previously he had developed a lesion over the sternum which was crusted and scaling. A month later he had a similar lesion on the penis, and soon after one appeared on the umbilicus. In August, 1928 (two and a half months before presentation), he awoke one morning with intense burning of the hands which were found to be covered with blisters. The bullous eruption spread over the arms and legs and rapidly became generalized. The eruption persisted with slight remissions.

The patient's general health was unaffected. There was no marked itching, no marked loss of weight and no history of contagion. The patient was admitted to the Vanderbilt Clinic, with a generalized pemphigus-like eruption, three weeks before being seen by the presenter. On the backs of the hands, on the forearms and on the lower part of the legs were areas of crusted dermatitis studded with tense and flaccid bullae from 1 to 2 cm. in diameter. Crusted lesions and a few bullae were thickly scattered over the trunk, face and scalp. About the umbilicus and in the deep suprapubic fold were large exuding areas with a slightly vegetating surface. There were no mucous membrane lesions. On the palms and soles were large hyperkeratotic patches stippled with deep pits, which seemed characteristic of arsenical keratosis.

Nikolsky's sign was marked, and the patient developed a crop of bullae on putting on his garters. A 50 per cent potassium iodide ointment produced no bullae. Culture from the bullae showed hemolytic *Staphylococcus aureus*. Two small bullae were sterile. Salt solution wheal persisted one and one-fourth hours (negative Aldrich test). The blood showed 0.058 mg. of arsenic per hundred grams dry weight twenty-four hours after an injection of sodium thiosulphate which was later increased to 0.28 mg. The blood count showed 8,400 leukocytes; 64 per cent polymorphonuclears; 20 per cent small and 6 per cent large mononuclears; 10 per cent eosinophils, and a moderate number of eosinophils in the blister fluid.

The patient said that he was retired from government service three years previously for nephritis, and that at that time he had a long standing edema of the legs which had since disappeared. Physical examination showed only cardiac hypertrophy. The urine was normal. The cardiorenal study was not completed.

PEMPHIGUS (?). Presented by DR. HOPKINS.

C. S., a widow, aged 37, born in Austria, was presented to the section from another clinic on April 5, 1927, with the diagnosis of pemphigus which was not questioned.

Application of ammoniated mercury seemed to exaggerate the condition. The patient was treated from June, 1927, with injections of staphylococcus toxin, wet dressings of acriflavine and opening of bullae followed by painting with gentian violet. The last procedure seemed the most effective. She improved slowly and by the middle of August her skin was completely clear. Repetition of the intradermal tests did not produce any bullae. A few weeks later she had an acute severe urticaria attributed to eating oysters, and since then had had periodic attacks of itching. There had been no recurrence of the bullous lesions.

DISCUSSION

DR. LAPOWSKI: Was there an itching sensation before you started to treat this patient?

DR. HOPKINS: In reply to Dr. Lapowski's question, there was practically no itching before treatment was begun.

I am greatly interested in the first patient. He came in with an almost universal eruption which looked like pemphigus; otherwise, he seemed well and vigorous. It seemed inconceivable that he could have so extensive a pemphigus without the slightest malaise or cachexia. Most of the bullae did not originate on entirely normal skin. It seemed to me that this was probably a superficial skin infection. It cannot be proved as yet. However, the patient has improved remarkably in three weeks with only local treatment.

I presented the other case (C. S.) for comparison. In this case the bullous lesions were grouped in a serpiginous pattern, chiefly about the axillae and groins. We were able to reproduce bullae in her skin by injections of staphylococcus toxin or vaccine. The condition cleared up completely under vigorous local antiseptic treatment, and she had remained well for nearly a year. The condition in this case, I believe, was definitely proved to be an extraordinary type of bullous impetigo.

ELEPHANTIASIS VULVAE. Presented by DR. GROSS.

M. P., aged 30, born in the British West Indies, stated that five months previous to presentation the labia had begun increasing in size. There were no symptoms excepting slight discomfort in walking. Five years prior to presentation the patient had been treated for genital sore with about eight intravenous injections. The patient said that after this treatment the blood test was negative and she was advised to discontinue the treatment. Vaginal discharge (yellowish and rather thick) developed at that time. She was treated for this by douches, but the discharge persisted.

Examination of the external genitalia showed three tumors of the labia minora; the upper two were fibrous and stony hard; the lowest was soft and doughy in consistency. There was chronic lymphangitis of the labia. Inguinal lymph glands were palpable and were of firm consistency.

Laboratory examinations showed a negative Wassermann test and a negative Kahn test (Oct. 29, 1928). Cervical smear showed gram-negative intracellular *Diplococci* (Nov. 5, 1928).

Biopsy showed a moderate edema of the epidermis which was particularly evident within the cells. It was somewhat flattened out. The basal layer showed hyperpigmentation; the corium was replaced by edematous fibrous tissue which was cellular; many of the cells had stellate shapes with elongated nuclei. In places, there was a moderate infiltration of round cells which appeared to be lymphoid. Many vessels were noted in that structure.

UNILATERAL PSORIASIS OR NEVUS UNIUS LATERIS (?). Presented by DR. BLOOM.

C. J., a boy, aged 16, born in the United States, came to the clinic on Jan. 10, 1928, with a skin disease of three years' duration. On the right elbow were noted several papules, dime-sized and smaller, which were covered with silvery scales. Below the elbow in linear formation were several coalesced red papules covered with small yellowish crusts. On the dorsum of the right hand along the ulnar side a similar line of coalesced dime-sized papules appeared; at the base of the index finger these turned in a right angle toward the radial side of the hand. These papules were violaceous in color and were covered with scales and thin crusts. No other lesion was found except pitting of the nails.

Later, the picture changed, by replacement of papules below the right elbow by follicular horny plugs and the existence of a scaly papule, the size of a dime, on the left elbow. The lesions on the dorsum of the right hand assumed a more verrucous character.

LEPROSY. Presented by DR. FEIT.

E. M., aged 25, born in the Virgin Islands, U. S. A. (from the Service of Dr. Throne of the N. Y. Skin and Cancer Hospital), said that he had never been sick before. He said that he had not had venereal infection. The present lesions

had started in April with nodules on the face, and had gradually involved the greater part of the body. There was a maculonodular eruption of a brown color. The ulnar nerves were thickened; there were pigmented macules, also areas of anesthesia. The Wassermann reaction was positive. Atrophy of the interossei was also noticeable. The nasal smear showed leprosy bacilli.

ERYTHEMA INDURATUM AND TUBERCULOUS ADENITIS. Presented by DR. FEIT.

Mrs. B. L., an American, a housewife, aged 34, had grip in 1914, and had noticed a lump in the left axilla about six months later. This lump was about the size of a small cherry and remained that way for about seven years, after which it opened, discharging thin pus. In 1925, nodules developed under the skin of both legs, which broke down several times. Two and a half years prior to presentation the patient came under the presenter's observation. At that time several subcutaneous nodules, about the size of a cherry, were present; there were also some ulcers and scars on the middle of both legs, just above the ankle. The tumors were attached to the skin and could be moved with the skin; the covering skin was a bluish red. A nodule, the size of a hazelnut, could be felt in the left axilla. Slight progress was made under treatment with fifteen injections of arsphenamine, ultraviolet light and cod liver oil. A considerable change took place when the patient received six injections of a gold compound, 0.025 Gm., which caused no toxic effect and resulted in complete healing. Tubercle bacilli were found in the discharge from the axillary tumor. The patient's father had tuberculosis of the throat. The Wassermann reaction was reported repeatedly as negative.

LUPUS ERYTHEMATOSUS, PAPULONECROTIC TUBERCULID AND ACNITIS. Presented by DR. ABRAMOWITZ.

Y. J., a woman, aged 19, born in Russia, a resident of the United States for sixteen years, was well until nine years prior to presentation at which time an eruption appeared on the bridge of the nose and from that time on spread over the rest of the face. The eruption had been present from time to time for about three years, until three years prior to presentation when the eruption developed on the extremities.

She was treated at the Israel Zion Clinic about nine months before being seen by the presenter because of lupus erythematosus and also for small pustular lesions of acnitis on the face. She had many scarred lesions on the extensor surfaces of the upper and lower extremities, some of which were still in the pustular stage. The hands and face showed acrocyanosis.

The patient received fifteen injections of gold and sodium thiosulphate from Feb. 9 to May 29, 1928, and fifteen injections from May 31 to Oct 20, 1928. The dose ranged from 50 to 75 mg. All types of lesions showed marked improvement. Results of the Mantoux test were positive on Oct. 30, 1928. Examination of the lungs and roentgen examination of the chest did not reveal any signs of tuberculous activity.

CHICAGO DERMATOLOGICAL SOCIETY

Regular Meeting, Oct. 17, 1928

FRANCIS EUGENE SENEAR, M.D., *Presiding*

A CASE FOR DIAGNOSIS. (MYCOSIS FUNGOIDES?) Presented by DR. ZEISLER.

M. W., a man, aged 30, had a disorder of one month's duration, which appeared one week after he had received an injection of antitoxin, after having stepped on a rusty nail.

Scattered over the trunk and extremities were lesions in various stages of evolution. Some were erythematous and discoid patches, and others were definitely

infiltrated; there were circumscribed lesions on the eyelids. A few of the lesions on the extremities were almost necrotic. On the trunk were several firm, cartilaginous, tumor-like nodules, the size of a button, imbedded in the skin. The glands were not enlarged, and the spleen was not palpable. Itching was not marked, but the multiplicity of the lesions and their distribution suggested fungoides.

The blood count showed: hemoglobin, 86; red blood cells, 5,200,000 (0.8); polymorphonuclears, 60; small mononuclears, 34 (abnormal red absent), and large mononuclears, 6.

There was a subpapillary infiltrate which encroached on the epidermis and surrounded the hair follicles. There were a few plasma and mast cells, numerous small deeply staining round cells and larger epithelioid cells. One giant cell was seen. There was no suggestion of a tuberculoid structure.

DISCUSSION

DR. MONTGOMERY: I favor a diagnosis of bromoderma. The microscopic picture is consistent with this diagnosis and does not show the features usually seen in mycosis fungoides.

DR. BECKER: Was a culture made?

DR. ZEISLER: The patient gives a history of occasionally taking bromoquinine, but has had none recently. The aspect today is entirely different from what it was three weeks ago. At that time the lesions were cartilaginous, firm, nodular infiltrates, suggesting almost a sarcoid, but the histology was not that of that disorder. The lesions involuted rapidly under roentgenotherapy and doses of arsenic. I thought the two lesions of the eyelids were interesting, because one so frequently sees granuloma fungoides with such manifestations. This may possibly be a case of dermatitis nodularis necrotica.

DR. LIEBERTHAL: I should like to know the outcome of a Wassermann test.

SYPHILIS (TERTIARY) OF TONGUE. Presented by DR. ZEISLER.

A man, aged 31, had a lesion of the tongue which had been present for eight months. He said that he had not had syphilis, but admitted the presence of a gonorrheal infection twelve years previously. The Wassermann reaction was 4 plus. There was a deeply infiltrated, ragged ulceration just anterior to the circumvallate papillae, and also an ulceration of the soft palate. A roentgenogram of the chest was negative for tuberculosis.

DISCUSSION

DR. BECKER: I should like to know how long the lesion has been present. It looks like a lingua plicata, although localized to the posterior portion of the tongue.

DR. STILLIANS: I am interested to know whether the condition clears up completely after treatment. The patient may have tuberculosis in connection with syphilis.

DR. FINNERUD: I thought also of the possibility that the condition was a postinflammatory keloidal process.

DR. ZEISLER: I think it would be worth while to try to obtain a biopsy. I do not believe that the lesion is involuting under treatment as rapidly as syphilis of the tongue usually does, and I have the impression that a diagnosis of tuberculosis of the tongue, which I first considered, may be correct. He has had three injections of neoarsphenamine within the past ten days.

A CASE FOR DIAGNOSIS. (DERMATITIS HERPETIFORMIS?) (PEMPHIGUS?) Presented by DR. OLIVER.

A physician, aged 43, in August, 1927, first noticed a bullous lesion on the left arm. In January, 1928, lesions appeared on the inner sides of the thighs and in the axillae. Various ointments and preparations were used. In February,

1928, he consulted Dr. Menage, who diagnosed the condition as dermatitis herpetiformis. Later, he was seen by Dr. Ralph Hopkins, who agreed with that diagnosis, but another consultant thought it a case of pemphigus. In June, 1928, he became worse, had some fever and a generalized eruption. On August 3, he went to the Mayo Clinic, where he remained until October 2. At the clinic he received colloidal and sulphur baths and ten injections of tryparsamide. The eruption entirely cleared up while he was there, but three days after he left the clinic, the condition recurred with bullous lesions in both groins, a few about the neck and several on the arms. The bullae were the size of a pea, some flaccid, others tense, and were situated on an erythematous base. There was some pruritus.

DISCUSSION

DR. ELLER: I think this is a case in which one cannot be dogmatic about the diagnosis, but I lean toward a diagnosis of dermatitis herpetiformis on account of the pigmentation and location. Against this diagnosis is the fact that the lesions are not typically grouped. The vesicles are much larger than one usually sees, although they do occur in that size in Duhring's disease, and the history of the duration is extremely short. In considering the whole picture, however, I am in favor of the diagnosis of Duhring's disease.

DR. LIBERTHAL: In this case, one has to consider toxic erythema, Duhring's disease and pemphigus. The long duration makes the first diagnosis improbable, while the multiform lesions and the character of the bullae make that of pemphigus doubtful. Yet, I would consider for this patient the Davis treatment for pemphigus which we have been using in our office for various chronic vesicular and bullous dermatoses with good results. We substitute, however, the ingestion of solution of potassium arsenite for the injection of iron cacodylate.

DR. ORMSBY: Dermatitis herpetiformis appears to be the most probable diagnosis. I do not believe that the presence of bullae is against the diagnosis. I think some of you will remember a patient who was presented about a year ago, with a large number of bullous lesions, and in which case the diagnosis was tentative between the three diseases mentioned by Dr. Lieberthal, with dermatitis herpetiformis coming first. During the year I have watched him I have concluded that this is the correct diagnosis. In that case some of the bullae developed on normal skin, with no sign of erythema. The lesions were widespread, and the disease was unusually virulent. Asiatic pills, given over a considerable period, gave much relief but apparently could not overcome the disease. This treatment was followed by doses of quinine, without particular effect. He was then given a series of injections of sodium cacodylate, which caused more improvement but did not clear up the disorder entirely. After a rest, he was given a series of injections of calcium chloride, which entirely cleared up the remaining symptoms, and he has remained well for three months. His apparent recovery is more complete than any I have seen in the length of time he was treated, and I believe the calcium chloride was a permanent factor.

DR. MONTGOMERY: When this patient was seen in the Department of Dermatology of the Mayo Clinic, he presented a generalized bullous eruption which was more marked on the thighs, axillary folds, chest and back. In these areas, there was marked crusting and some vegetating lesions. Considerable difficulty was encountered in differentiating between a dermatitis herpetiformis and a pemphigus, but after a period of observation we inclined to a diagnosis of pemphigus vulgaris of a mild type. He was given a course of tryparsamide, under which treatment the condition cleared up. During the first few weeks, however, he continued to develop clear bullae without any zone of erythema around them. I am glad to hear Dr. Ormsby say that he has seen the development of such bullae in cases of dermatitis herpetiformis.

DR. FOERSTER: The patient is interested in the removal of his tonsils, which has been advised by some and advised against by others. I should think that in toxic conditions it would be a good thing to have them removed, and to expect

an initial flare-up with a subsequent improvement in or disappearance of the disorder. As to its effect in Duhring's disease, I think it would have no effect one way or the other.

DR. ZWICK: A consensus seems to be developing that the sensitiveness (described by Besnier, Jadassohn, Brocq and others) to iodine which characterizes Duhring's disease might be made to serve as a differential diagnostic sign. The provocative action exerted by the internal administration of iodides is a familiar phenomenon. Jadassohn's school, however, has devised a quasi biochemical diagnostic test for the differentiation of pemphigus and dermatitis herpetiformis. It consists in the application of a mixture containing 50 per cent petrolatum and potassium iodide to areas of healed lesions. A brisk reaction occurs in the case of Duhring's disease, whereas the skin of a patient with true pemphigus remains quiescent. Bromides produce a similar effect; the sodium salt of hydriodic acid is inactive. Not so much with reference to this particular case, but as a matter of general information, I should like to ask the members whether they have had any experience with this test?

DR. MONTGOMERY: We have used the "Iodine Test" on a few patients and obtained a marked reaction in dermatitis herpetiformis and a mild reaction in pemphigus.

DR. OLIVER: I am glad to hear this expression of opinion and am sure the patient is. Both Dr. Senear and I felt that it was a dermatitis herpetiformis rather than a pemphigus.

A CASE FOR DIAGNOSIS. Presented by DR. SENEAR and DR. WIEN.

A. W., a Jewish boy, aged 15, had an eruption on the face and sides of the neck of about one year's duration. The first change was noted in July, 1927, in the appearance of a patch of crusted dermatitis about the left ear. The crust came off and the patch gradually increased in size, with the associated development of fine scaling on the lesions, especially when exposed to the sun. The condition had extended so that at the time of presentation it involved both cheeks in front of the ears with extension on the neck, and a patch on the forehead. It had been stationary for the past two months. There was no subjective sensation.

The patient presented mottled areas of dull red to light brown pigmentation about both ears, extending in front and below to the side of the neck, with greater involvement on the left side. The right patch was 4 by 6.5 cm., and the left 7 by 5 cm. There was a linear band of pigmentation and mottling at the hair margin on the forehead, extending 2.5 cm. down and 10 cm. across; scattered annular lesions, with slightly depressed centers, about 5 mm. in diameter, were discretely scattered on the face and at the margins of the areas of mottled pigmentation. The pigmented areas exhibited small foci of superficial atrophy, from 2 to 5 mm. in diameter, with intervening bands of reticular pigmentation in which telangiectasia was evident. There were no other cutaneous lesions on the trunk or extremities, and the buccal mucosa was normal. There was a slight, noninflammatory puffiness of the eyelids.

The past history was negative except for the usual diseases of childhood, influenza in 1918 and an attack of "kidney trouble" in 1927, associated with puffiness of the eyelids. The tonsils were removed nine years before presentation. The family history was irrelevant. Physical examination of the chest gave negative results. Urinalysis revealed a faint trace of albumin, but no casts or pus cells. The blood showed: hemoglobin, 78 per cent; red blood cells, 3,750,000; white blood cells, 11,400. The differential count showed: 58 per cent polymorphonuclears, 2 per cent large mononuclears and 40 per cent lymphocytes. The Wassermann reaction of the blood was negative. Roentgen examination of the chest showed the average amount of markings of the hilum. The sella turcica was of normal size.

Microscopic examination of a section of tissue removed from an active lesion at the side of the neck revealed two distinct sets of changes which seemed to represent different stages of the same process.

From the histologic appearance, the condition seemed to be inflammatory and limited to the upper layers of the skin, the epidermis and the adjacent cutis. The stages observed in the sections were of a chronic inflammatory nature leading to atrophy of the skin and disappearance of the elastic tissue. The large number of chromatophores present explained the pigmentation. With the exception of the large number of pigmented cells, the pathologic description answered, in nearly all respects, that of the lesions described as the early stages of poikiloderma vascularis atrophicans. From the signs of beginning atrophy, it seemed possible to predict that the end-stages also would resemble this condition.

DISCUSSION

DR. WILE: The two possibilities that suggested themselves to me at once were an unusual form of erythematous lupus, and an atrophic form of lichen planus. Of the two, in spite of the extraordinary localization, I would be in favor of an unusual form of erythematous lupus.

DR. H. R. FOERSTER: I believe this case represents the telangiectatic type of erythematous lupus. The distribution of the lesions, their configuration, the atrophy and the character of inflammatory reaction favor the diagnosis of lupus erythematosus. Horny plugs and patulous follicular orifices may be absent in the telangiectatic type of this disease.

DR. OLIVER: I thought it was probably a condition of atypical lupus erythematosis.

DR. SENEAR: We considered the two conditions mentioned. We thought the pathologic condition was more like that of lichen planus than of lupus erythematosus, but, as stated in the history, the patient was seen just after I had read Little's article on poikiloderma Civatte, which may be different from the other type. In comparing the patient with the picture of that disease, and finding apparently a similar pathologic condition at the University, we felt that the latter condition had to be considered. We shall work further along this line.

DYSCHROMIA. Presented by DR. ORMSBY.

A girl, aged 13, had a disorder of six years' duration. It consisted of numerous large brown areas on the trunk, arms and thighs. The first change noted was on the neck. Subsequently, the lesions developed in other areas. None of the lesions had disappeared. They began as small areas and increased in size by peripheral enlargement. No extension had been noted in the past two years.

On examination, the pigmented areas were seen to be irregular, oval, round or scalloped, varying in size from that of a small coin to that of the palm and larger. They were roughly symmetrical, though the lesions on the two sides were not identical in size or configuration. There was neither infiltration nor scaling. Certain areas were slightly wrinkled and presented distinct clinical signs of atrophy. In these the deep veins were more clearly visible than in the surrounding skin.

The skin outside of the pigmented areas was pale. The patient complained of feeling tired much of the time. The hemoglobin was reduced to 70 per cent; otherwise, the blood was normal. A roentgenogram of the suprarenal glands did not reveal abnormal conditions. The basal metabolism rate was minus 11; the blood pressure was 88 systolic and 48 diastolic. Nothing abnormal was found in the urine. The general physical examination did not show other abnormal conditions.

A section was shown and described by Dr. Finnerud as follows:

There was increased pigment in the epidermis, chiefly in the basal layer, but extending upward and in some places involving two or three layers of cells. The epidermis was slightly thinned in places, and cornification was interfered with. In these areas, the stratum granulosum was replaced by prickle cells, which were larger and paler than elsewhere. They were slightly granular and polygonal. Vacuolization was present in some of these as well as in other epidermal cells.

In the corium, there was some connective tissue degeneration and atrophy in the papillary portion. An abnormal number of chromatophores were scattered throughout the corium.

DISCUSSION

DR. ZEISLER: This case is extraordinary. The areas of pigmentation are in striking contrast to the pallor of the child. I think that she probably has a slowly growing neoplasm, with pressure on the suprarenals, and that the pigmentation is of the suprarenal type.

DR. STILLIANS: I was impressed with the slight but definite atrophy of the skin in the pigmented areas. I thought of the combination of pigmentation and atrophy, which occurs with scleroderma, a disease supposedly due to some endocrine disturbance.

DR. WILE: At first glance, when the patient is seen from a distance, one would at once suspect a phenolphthalein eruption. There is a definite serpiginous outline, and the distribution would fit in well with that disorder; however, on close analysis, there is a definite but slight atrophy of the pigmented patches, which is an outstanding feature of the case. After looking at the child closely, I got the impression that a serious disorder of pigment anomaly was being dealt with. I think that in all probability this is a severe endocrine disturbance, with perhaps suprarenal insufficiency. If this condition could be proved, such a degree of hyperpigmentation carries with it a serious prognosis for life in the future. I think no one could offer a diagnosis other than that of an extraordinary vicarious pigmentation with atrophy. Taken with the low blood count and the pallor of the child, it would seem that the pigmentation is a part of the syndrome. The blood pressure is within the high limits of low blood pressure, and I think the low diastolic pressure is much more significant of trouble than the systolic. It is extremely suggestive of suprarenal hypofunction.

DR. BECKER: In general, the pigmentation accompanying disease of the suprarenal gland is not associated with atrophy. The low basal metabolic rate, however, is suggestive of a lack of cortical suprarenal substance. We have recently had several patients with lowered basal metabolic rate and some symptoms of hypothyroidism, to whom we gave thyroid substance without subsequent improvement. These patients were then given a special suprarenal preparation, which is being studied by Dr. Koehler, with marked improvement. The lesions in this case are similar to those in a case reported by Peck and Kartagener (*Dermat. Ztschr.* **52**:81, 1928). In that case the lesions tended to be unilateral, while in the case under discussion they are bilateral. In Peck's case, the lesions were accompanied by muscular atrophy; so some nervous disorder was suspected. No abnormalities could be demonstrated in either the endocrine glands or the sympathetic nervous systems.

DR. ORMSBY: I considered the various possibilities in this case, just as other members have brought out, and finally concluded that the dyschromia is probably produced by disturbance of the suprarenal gland. The nature of the disturbance is unknown, but it does not appear to be a new growth. The roentgenogram shows nothing. I think we have exhausted everything in the way of examination; so we will have to watch developments and possibly report later.

LUPUS ERYTHEMATOSUS. Presented by DR. BECKER.

A man, aged 40, first noticed a lesion over the sacrum one year before presentation, and lesions appeared on the scalp three months later. They enlarged slowly, and some of them involuted, leaving scars. Some were treated with the ultraviolet ray, and ointments were used locally. Over the sacral region was a plaque 5 by 7.5 cm. in diameter, which was violaceous and composed of anastomosing linear elevations. On the scalp, both anteriorly and posteriorly, were lesions in various stages. The earlier ones were violaceous papules, which apparently became atrophic centrally, spread peripherally and finally involuted, leaving depressed

smooth pink scars with follicular destruction and hyperpigmented borders. The involuted lesions were from 1 to 2 cm. in diameter. A physical examination revealed nothing; the results of a Wassermann and Kahn test of the blood as well as those of urinalysis were negative.

The epidermis was acanthotic, and showed hyperkeratosis and parakeratosis in varying degrees. The papillary portion of the dermis and contiguous epidermal cells were slightly edematous. In the remainder of the dermis and extending even into the subdermis, the blood vessels and hair follicles were surrounded by a massive infiltrate, consisting largely of small round cells.

DISCUSSION

DR. FINNERUD: I think, particularly from the appearance of the lesions of the scalp, that this is a case of lupus erythematosus, and, as some of the others remarked, that the scaling lesions had some of the appearances of those in the case presented by Dr. Senear and Dr. Wien.

DR. ZWICK: I would favor the diagnosis of lupus erythematosus, with a somewhat atypical localization of the lesions.

DR. BECKER: When we first saw this patient, the lesions had not progressed so far, and were principally lichenoid, suggesting atrophic lichen planus. Later, there was atrophy in the sacral lesion. None of the lesions showed follicular plugging. The histologic observations established the diagnosis of lupus erythematosus.

MULTIPLE CYSTS. Presented by DR. ORMSBY.

A man, aged 27, had a disorder of fourteen years' duration. The lesions were first noted on the arms and later on the legs and trunk. There had been no subjective sensation, and no lesions had disappeared. After attaining a certain size, they had remained stationary.

On examination, it was found that the lesions were distributed on the flexor surfaces of the arms, over the chest, back and abdomen, and on the neck, groin, thighs and legs. They were uncolored, tumor-like nodules, varying in size from that of a pea to that of a hazelnut. They were attached to and movable with the overlying skin. Pseudofluctuation could be demonstrated, and a milky fluid was removed and demonstrated. A section of the tumor was described by Dr. Finnerud as follows:

The epidermis and corium showed no change other than the presence of a large cyst which extended from the lower portion of the corium to the papillary layer. The lining of the cyst consisted of about four rows of epithelial cells, which showed in places unencapsulated groups of cells identical with those of normal sebaceous glands, with the exception that some of these cells were slightly atrophied. The sections showed the transition of these sebaceous gland cells into the type of cell that made up the lining of the cyst.

DISCUSSION

DR. ELLER: I think this is a case of multiple sebaceous cysts of an unusual type and in atypical locations.

DR. STILLIANS: I was wondering whether the fluid obtained from the cyst had the odor of fatty acid.

DR. MITCHELL: This is an extraordinary case. Recently, I saw a young woman with a few lesions, one on the throat and one on the forearm, which had the same milky, odorless material in the cyst. After the lesion was punctured and the sac was taken out, the lesions cleared up without delay. I think they may have been the same type of lesions as in this case.

DR. WILE: I agree that this case is extraordinary. The lesions occurred in places in which sebaceous glands are present but are not predominant; the character of the fluid was too thin to be that of inspissated sebum, and it had not the odor that one associates with retained sebum. There are only two sub-

stances in the human body that I know of which are white, in which fat is in suspension. One is sebum and the other chyle. I do not know how chyle could get into the skin in this way, but I think a chemical diagnosis of the fluid would give information which one cannot get through the microscope. There were some cells on the margin of the cyst that looked like sebaceous gland epithelium, but there was no way of showing them adjacent to the hair follicle. I thought the histologic picture was not helpful, except in showing that we are dealing with encysted fluid. I believe the only way to clear up the case is by chemical analysis of the fluid, which should show whether it is sebum or some other extraneous substance.

DR. ZWICK: The absence of a marked odor of the aspirated content of the cyst would lead me to reject the diagnosis of sebaceous cyst, because the odor frequently described as characteristic of the secretion of the sebaceous gland is, at least in part, due to secondary (oxidative) changes, which occur after exposure to the air and contamination with organisms.

I am inclined to consider — notwithstanding its comparative rarity — lymphangioma as a diagnostic possibility, especially on account of the somewhat milky appearance of the aspirate. A microchemical examination, if one can get sufficient fluid, should point the way to a definite diagnosis. I hope Dr. Ormsby will succeed in obtaining the necessary material, as this is certainly an interesting condition.

DR. MONTGOMERY: I wish to point out that histologically the cyst does not contain the sebaceous material and debris seen in the ordinary sebaceous cyst. The wall of the cyst is extremely thin. Attached to this wall, however, in several areas there are groups of sebaceous cells in gland formation. These cells are well preserved and have a definite reticular network, and though smaller than the cells of a normal sebaceous gland, they have all the appearances of proliferating rather than degenerating cells. I would suggest that serial sections be made in order to determine the relationship of the cyst to the epidermis and its appendages.

DR. FINNERUD: In all the sections there are encapsulated masses of cells in the wall of the cyst which resemble the sebaceous gland cells, except that they appear atrophic. We thought of the possibility that the cysts might have originated from embryonic sebaceous gland structures, which also might account for the unusual contents of the cyst. The transition is rather definite between the encapsulated group of cells and the lining of the cyst.

DR. ORMSBY: We did not examine the fluid for the reason that on the one occasion that I saw the patient before, he objected to having a puncture made, but he did not object to having one of the cysts extirpated for examination. Today, he finally consented, and we will have the material studied. I have gone over the literature of sebaceous cysts rather thoroughly since seeing this patient, but have found nothing that corresponds to this case. My first impression was that it might prove to be a case of lymphangioma, but the histologic section eliminates that disorder.

DR. WILE: If I may be permitted a few words more, I would like to say that there is one other place that one finds fat that I did not mention. I wonder whether it would not be well to take a specimen of the blood of the patient to see if there may be a lipemia. A patient with an excess of fat in his blood might possibly establish fat deposits in the skin, at various places.

Note: Subsequent to the meeting, a chemical examination of the milky fluid described was made by Dr. Ralph W. Webster. He stated that it consisted of free fat globules, cholesterol crystals, flat epithelial cells, an occasional leukocyte and some undetermined granular material. Chemical tests for albumin were positive. With the amount of material available, the differentiation between sebum and chyle or lymph was not positive.

LEIOMYOMA. Presented by DR. OLIVER, DR. FINNERUD and DR. ZEISLER.

A. C., aged 66, had an eruption of four years' duration. The lesions were a group of firm, elevated nodules situated just below the tip ot the scaphoid on

the right side of the back. They occurred in a group, covering an area the size of a palm, and were arranged in lines, following the lines of cleavage. They ranged from 2 to 10 mm. in diameter, were reddish brown, oval and elliptical. The patient was unable to give an intelligent history, but indicated that they were tender and painful on pressure.

Microscopic examination showed them to be made up of interlacing masses of muscle fibers.

LUPUS VULGARIS. Presented by DR. FINNERUD.

CASE 1.—A boy, aged 16, of foreign birth, had a lesion of three years' duration, which involved the entire lobe of the left ear. The condition had always been without subjective symptoms, and was of approximately its present appearance when first noticed, except that it was redder and less swollen.

Examination showed a soft nodule, apparently composed of numerous confluent individual nodules, which made the lobe about twice its normal thickness. Individual nodules of a characteristic lupus vulgaris color could be seen under diascopic pressure. Histologic examination revealed numerous nests of epithelioid cell, with little plasma cell and lymphocytic infiltrates and with no giant cells. Histologically, it was a classic illustration of sarcoid.

CASE 2.—A Russian Jewess, aged 31, had a lesion of twenty-four years' duration on the left cheek. She stated that it had grown more rapidly during the past years than previously. The lesion was without subjective symptoms. It began as a soft red spot, the size of a finger nail, and gradually attained its present dimensions. She was the mother of four children, all living and well, and had had no notable illnesses. There was no family history of tuberculosis or other noteworthy disorders.

Examination revealed a soft, nodular, slightly protuberant growth in this area, about 5 cm. in diameter, brownish to purplish red and slightly scaling. At its border were numerous lighter brown nodules, which had the characteristic color of lupus vulgaris on diascopic pressure.

DISCUSSION

DR. H. R. FOERSTER: The lesion on the lobe of the ear is clinically tuberculosis, suggestive of the lupus vulgaris type, and histologically sarcoid. A logical question concerns the choice of terminology. I would consider it a particular type of cutaneous tuberculosis, with the histologic characteristics of sarcoid.

DR. STILLIANS: It is a question whether the clinical or the microscopic observations should give the name to a disease. I am in favor of following the clinical appearance when a choice has to be made.

DR. BECKER: I believe that workers who see a great deal of lupus vulgaris are inclined to call it lupus vulgaris of the sarcoid type, combining the clinical and histologic diagnoses.

DR. H. R. FOERSTER: I think the clinical diagnosis should have preference.

DR. MONTGOMERY: In this case I would favor the diagnosis of inoculation tuberculosis rather than lupus vulgaris or sarcoid. The sections showed a marked central caseation necrosis, which is usually a prominent feature of the microscopic picture of the former and not of the latter two conditions. A microscopic differentiation, however, may often be impossible. Clinically, the lesions were a little soft and boggy to the touch.

BLASTOMYCOSIS. Presented by DR. MITCHELL.

A man, aged 27, was first presented at the April meeting and was shown again to demonstrate the results of intravenous injections of iodine. Immediately after the demonstration, the patient disappeared. When he returned in August, new lesions had developed, and the original lesions were many times larger. The

response to intravenous injections of compound solution of iodine was immediate. The condition was healed at the time of presentation, except for one slightly active lesion in the dorsum of the right hand.

DISCUSSION

DR. ORMSBY: I was much interested in seeing this case. We have had a long experience with this disorder, and now and then come across a case in which the condition is difficult to clear up with any method. Any additional weapon is always welcome.

DR. STILLIANS: Has it been determined that a compound solution of iodine is more efficacious in these cases than sodium iodide, the administration of which is much easier?

DR. ZWICK: It would be interesting to hear from Dr. Mitchell and the other members, whether, in their experience, the therapeutic effect of solutions containing iodine (like Lugol's) in addition to the iodide is superior to the iodine alone?

Since the elementary iodine is almost at once reduced to the iodide on coming in contact with proteids, one might expect — on chemical grounds — that the therapeutic results of the two solutions would not differ materially.

Of course, the clinician, not the chemist, is the arbiter in this case, and it is for that reason I bring up the subject, because if the iodide were equally satisfactory, its use would be preferable, because it is less irritating.

DR. ORMSBY: The therapeutic difference may be due to the method of administration, acting similar to sodium iodide which is more potent when given intravenously than when administered orally.

DR. MITCHELL: I felt that in view of the work of Ravaut and his associates I should try this method. This patient has been difficult to manage. He would not take anything by mouth, and at times would not come in for routine observation. I managed, however, to give him twelve injections. Ravaut claims that the injection is not painful and that patients do not object to it, but this man found it extremely painful. I have treated three patients, one with ringworm, one with favus of the scalp and this patient. I think perhaps sodium iodide would have done as well, but it is interesting to have used this method in this disorder. I gave him 5 cc. diluted ten times with water, and it still was painful.

A CASE FOR DIAGNOSIS. Presented by DR. ZEISLER.

A negro, aged 45, had a generalized lichenoid papular eruption over the trunk and extremities, with areas of depigmentation around the elbows and shins. The condition had been present for many years. He had worked as a photographer all his life, and thought he had metol poisoning. At the time of presentation, he had a lesion of the prostate which had been diagnosed carcinoma, with urinary symptoms.

The blood count showed: 4,000,000 red cells; 11,000 white cells; 65 per cent hemoglobin; 54 per cent polymorphonuclears; 24 per cent lymphocytes; 4 per cent transitionals, and 16 per cent eosinophils.

DISCUSSION

DR. LIEBERTHAL: Were there at any time crusted lesions? I would suggest thinking of tuberculid.

DR. FOERSTER: I reached no conclusion in this case, but considered lichen planus and the possibility of tuberculid.

DR. STILLIANS: We used to see such cases rather often in patients of the colored race at the Cook County Hospital, and I have always considered the condition a form of lichen simplex.

DR. MITCHELL: I was interested in the man's occupation, photography. I have seen a somewhat similar case in a photographer, which was extremely exten-

sive and pruritic, and which was present for many years while the man was engaged in work in the dark room. Later, he was advanced to taking pictures and improved greatly, but he afterward was reduced to the ranks and returned to the dark room, following which his disorder recurred as an extensive eruption. It was at this time that I saw him. I gave him a series of injections of sodium thiosulphate, and was amazed to see how rapidly the irritation disappeared. He was out of the dark room for a while, but was obliged to resume work in it, and later returned to me with a marked recurrence, which yielded to the same therapy. I did not test him, but assumed that the condition was probably due to metol.

DR. ZWICK: My impression of this patient is that of a case of lichen planus. Although my experience with diseases of the skin in negroes is not extensive, I think that the depigmentation seen in this case is paralleled by analogous changes present, at times, in lichen planus atrophicus of the white race.

In connection with the hypothesis (advanced by H. Fischer), attributing the follicular localization of the lesions in lichen planus to the excretion of toxic substances through the follicular epithelium, it is interesting to note that the patient's occupation as a photographer requires him to handle constantly a number of chemicals (metol, pyrogallol, hydrochinone) which are known to be toxic on prolonged absorption. Of course, it would be necessary to establish the presence of the chemicals mentioned in the lesions of the patient. Memmesheimer's demonstration of the presence of considerable quantities of arsenic in cutaneous lesions occurring during a course of injections of Ehrlich's arsenicals and simulating or representing a lichen planus lends support to Fischer's conception.

The administration of thiosulphate, as an eliminative and reducing agent, would seem to be of interest from both a therapeutic and a diagnostic standpoint.

A CASE FOR DIAGNOSIS (ACANTHOSIS NIGRICANS). Presented by DR. SENEAR and DR. CORNBLEET.

M. S., a Jewess, aged 17, first noticed the present condition of the skin two years before presentation. It consisted of brownish patches, the size of a coin, on both sides of the thorax, which gradually increased in size to involve the axillae. The condition then appeared on the neck and finally on the bends of the elbows. No other areas had been involved.

Three months before presentation, when the patient was first seen, mottled, verrucoid patches were found encircling the neck, in the axillae, on the sides of the thorax and over the midportion of the chest. They were not thickened, but were uneven to the touch, bronze and poorly defined. There was mild itching. Nothing abnormal was found in the history and general examination, except obesity. She weighed 280 pounds (127 Kg.), and first showed this tendency toward corpulency when 9 years of age. The menses were painful, lasting about sixteen days, and began at the age of 13. There had been six attacks of appendicitis during the past three months. The basal metabolic rate was minus 10 per cent; cultures and scrapings from the involved areas showed a nonpigment-forming yeast and otherwise a mixed bacterial flora. Nothing positive was found in other laboratory work. Stained sections from a biopsy were shown.

Sulphur ointment was applied without effect. Soon after she was placed on a reducing diet by the medical department, on which 30 pounds (13.6 Kg.) were lost in two months, the pigmented patches involuted rapidly but not completely. Progress had been at a standstill for about six weeks, with short periods of exacerbation and remission, which seemed unassociated with the menstrual cycle.

DISCUSSION

DR. H. R. FOERSTER: I believe the case was presented as an early form of acanthosis nigricans, and I am in accord with that diagnosis.

DR. ORMSBY: I also agree with the diagnosis of acanthosis nigricans. Some years ago, when Dr. Mitchell was associated with me, we had a similar case, the

chief difference being that in our case there were lesions under the breasts as well as between them, as in this case.

DR. BECKER: I agree with the diagnosis, and think this condition occurs more frequently than we believe. I had a patient, also an obese Jewess, with psoriasis and mild acanthosis nigricans, who also had some endocrine disturbance. She had alternate menorrhea and amenorrhea, each one lasting as long as three months. One would find mild acanthosis nigricans more frequently in obese persons if it was carefully sought for.

DR. WIEDER: I think it will take time to corroborate the diagnosis after the lesions have become more definite. I would suggest close observation and a second biopsy later on.

A CASE FOR DIAGNOSIS (LUPUS ERYTHEMATOSUS). Presented by DR. BECKER.

A man, aged 36, first noticed a lesion over the zygoma of the left side five months before presentation. It was pruritic and scaly, spread peripherally and healed in the center. At the time of presentation, there was an arciform lesion, 1.5 cm. in diameter, with a pinkish infiltrated border from 2 to 3 mm. across. The center of the lesion was slightly hyperpigmented, but showed no anatomic change. The active portion of the lesion was not scaly. Results of physical examination and the Wassermann and Kahn reactions of the blood were negative. An intracutaneous injection of Koch's old tuberculin was followed by normal reaction.

The epidermis was thin and slightly hyperkeratotic and parakeratotic. Both the epidermis and the dermis were moderately edematous. In the dermis were perivascular and perifollicular collections of small round cells. The elastic and collagen fibers were somewhat degenerated.

DISCUSSION

DR. STILLIANS: I thought of lupus erythematosus, although the lesion was not entirely characteristic of that disorder.

DR. FINNERUD: I thought only of lupus erythematosus, and believe it a simple case of that disorder. It is interesting that in some of the cases with superficial lesions, the lesions come and go for some time before becoming stationary.

DR. FOERSTER: I thought it was a case of lupus erythematosus, both clinically and histologically.

DR. OLIVER: This case was similar to one that Dr. Finnerud and I saw at the Cook County Hospital several months ago. The condition cleared up nicely under treatment with gold and sodium thiosulphate.

DR. BECKER: When we first saw this patient some months ago, the lesion was smaller than at present, and appeared inconsequential. We considered lupus erythematosus, granuloma annulare and erythema elevatum et diutinum. The histologic picture established the diagnosis of erythematous lupus.

NEW YORK DERMATOLOGICAL SOCIETY

PAUL E. BECHET, M.D., *Secretary*

Regular Meeting, Oct. 23, 1928

HOWARD FOX, M.D., *President*

A CASE FOR DIAGNOSIS (DERMASTITIS HEMOSTATICA). Presented by DR. HIGHMAN.

H. C. Q., a man, aged 24, had an eruption on the palms and between the third and fourth toes of the right foot for about three years. There was little, if any, itching. The general history was negative. On examination, there was

tylosis of the palms and soles and the flexor surfaces of the fingers. At the margin of some of the lesions on the feet, there were grouped vesicles. These were sufficiently characteristic to suggest the likelihood of tinea. On each instep, there was a curious patch about 3 inches (7.6 cm.) long and 2 inches (5 cm.) broad, composed of densely grouped telangiectatic points on a slightly pigmented background.

The condition suggested the beginning of one of the essential telangiectasias, but was typical of none of them.

DISCUSSION

DR. WHITEHOUSE: Clinically, the condition reminds me of dermatitis hemostatica following inflammatory conditions of varicosis of the legs, a condition elaborated before this society by our late member, Herman G. Klotz.

DR. MACKEE: I agree with the diagnosis of dermatitis hemostatica. I should say that it is marked vascular disturbance in the skin with purpura and telangiectasia following dermatitis that was caused by a combination of poor circulation, scratching and perhaps a toxic element.

DR. WISE: I agree with Dr. Whitehouse and Dr. MacKee.

SCLEREMA NEONATORUM. Presented by DR. HOWARD FOX.

P. R., a girl, aged 5 months, was presented as a case in which a complete recovery had been made from an extensive sclerema neonatorum. There was no eruption at the time of presentation. The infant was born of apparently healthy parents, who had been married two years. Labor had been normal. At birth, the baby weighed 7½ pounds (3.4 Kg.) and appeared in good health. The disease first appeared when the child was 2½ weeks old. She was first observed by the presenter when 6 weeks old. At that time she presented extensive changes in the skin and subcutaneous tissues, consisting of firm, hard, diffuse thickening which did not pit on pressure and on which the skin was hidebound. The disease appeared on the cheeks, greater part of the back, buttocks, thighs, calves and vulva. There was some blueness of the skin of the back. The general health was good, and the infant continued to gain in weight. A biopsy was obtained, and histologic examination showed changes in the subcutaneous fat, considered by Prof. Alexander Fraser to be unquestionably those of sclerema. There were no changes in the hypoderm suggesting scleroderma. The patient continued to gain, and the skin became gradually soft and normal; when the patient was about 3 months old all traces of the disease had disappeared. The case will be reported in detail later.

DISCUSSION

DR. MALONEY: I saw this infant when she was 1 month old, at which time she presented the clinical picture of sclerema neonatorum. The entire disappearance of the lesions since that time is remarkable.

DR. WHITEHOUSE: This is the first case of the kind, to my knowledge, to be presented at this Society.

DR. HOWARD FOX: It is probable that this is the first case of this disease to be shown before the Society, as nearly all of these infants are extremely ill and live only a few days. This was the exceptional type, in which the infant remained in good health in spite of the extent of the eruption; the disease completely disappeared in a comparatively short time. The occurrence of mild types was called to attention by Dr. Gray of London on his recent visit to the United States. The differential diagnosis between sclerema and scleroderma had been considered, and I do not see how it could have been definitely settled without a biopsy. To my knowledge, there are only three cases of scleroderma in infants in which the diagnosis has been proved histologically. Other cases in infants have been considered scleroderma without, I think, sufficient proof.

FOLLICULITIS DECALVANS ET ATROPHICANS (LITTLE). Presented by DR. BECHET.

W. J. A., a man, aged 39, said that the lesions on the scalp had been present for one and a half years. The scalp was covered with irregularly shaped, bald patches, with smooth, shiny, scarred surfaces. There were projecting keratotic plugs at the periphery of many of the patches. The plugs seemed most numerous where the disease was active, and could be expressed with a comedo extractor. Inflammatory symptoms in the active areas were scarcely noticeable.

DISCUSSION

DR. HOWARD FOX: I should like to know if any one has ever seen the slightest benefit derived from treatment for folliculitis decalvans.

DR. CLARK: I have seen one case in which the lesions cleared up. That result was obtained with an ointment containing 20 per cent ammoniated mercury and 8 per cent salicylic acid. The ointment was applied at night, and was removed with soap and water in the morning; a surgical solution of chlorinated soda was applied for about half an hour.

DR. MACKEE: I agree with the diagnosis and also with the type. The more common type has, as active lesions, follicular pustules at the advancing margins. The less common type shows follicular keratosis. Otherwise, both types are the same—slowly advancing intermittently active margins, permanent alopecia, atrophy and tendency to spontaneous recovery in adult life. At maximum development, the patches are seldom larger than the palm of an adult, and there is usually only one patch. I have tried all kinds of therapy with doubtful success.

DR. BECHET: It seems to me that there are two clinical types of folliculitis decalvans: (1) an ordinary folliculitis without keratotic plugs, and with considerable inflammatory symptoms; and (2) a folliculitis with little, if any, inflammatory symptoms, and marked follicular hyperkeratosis and plugs. The case I am presenting belongs to the latter type, which Dr. McCafferty reported in the last number of the ARCHIVES as a rarity—a fact of which I was not aware, as we not infrequently encounter this condition in our clinical work. The alopecia in both types is equally extensive and permanent.

LYMPHANGIOMA. Presented by DR. MACKEE.

Mrs. L. M., aged 65, presented an eruption on the nose which had been present for thirty-five years. An accurate history of the incidence and evolution of the eruption could not be obtained. The eruption consisted of a soft, irregular, dull red swelling which occupied the bridge and sides of the nose. There was considerable scar tissue, the result of several operations. There were a number of thick-walled vesicles, varying in size from that of a pinhead to that of a pea, scattered through the tumor. At first glance these appeared to be the pearl-like nodules of epithelioma, but they collapsed under pressure, and when punctured a clear yellow fluid exuded for several hours. The amount of fluid that escaped or that could be pressed out of the vesicle was out of all proportion to the size of the vesicle, and suggested direct connection with lymphatic vessels. Furthermore, the spongy consistence of the tumor suggested large lymph or blood cavities or channels.

The vesicles were somewhat pearl-white, while the tumor as a whole was dull red. A biopsy had not been performed. The clinical diagnosis was hemangiolymphangioma or plain lymphangioma (nevus lymphangiectodes), developing at the age of 30. The elephantiasic type of chronic lymphangitis had also been considered. Therapeutic suggestions were requested.

DISCUSSION

DR. WHITEHOUSE: I am inclined to agree with the diagnosis. It certainly looks like lymphangioma—a benign growth. Radium treatment or applications of carbon dioxide snow have proved curative in these cases.

DR. FRASER: I agree with Dr. MacKee's clinical diagnosis. Whether the growth is hemangioma, lymphangioma or a combination of both can be decided only by microscopic examination.

DR. HOWARD FOX: I should like to ask Dr. MacKee whether the scar tissue was present at the outset or was a result of treatment.

DR. MACKEE: The scars were not originally present. They were produced by several operations.

SCLERODERMA ASSOCIATED WITH ATROPHY OF THE SKIN. Presented by DR. WISE.

Miss O. S., aged 29, a musician, from the Post-Graduate Skin Clinic, had cutaneous trouble for two years. Her general health was normal. She presented the lesions of scleroderma on the inner surfaces of the thighs, on the abdomen, and a few small disseminated spots on the arms. These lesions varied in size from 1 to 6 inches (2.5 to 15.24 cm.) in diameter; they were oval and round, and the edges were well defined. They appeared in different stages of evolution; those on the abdomen had become distinctly atrophic and soft, while two recent patches on the thighs were fibrotic and slightly indurated. Pigmentation accompanied all of the plaques, but there was an absence of telangiectasia at the margins. There were no subjective symptoms.

The lesions improved under massage.

DISCUSSION

DR. BECHET: In answer to Dr. Wise's request for therapeutic suggestions, I should say that I have at times observed really remarkable results from glandular therapy and thorough massage with any of the bland ointments.

DARIER'S DISEASE (INCIPIENT STAGE). Presented by DR. HOWARD FOX.

I. M., a Jewish woman, aged 22, born in the United States, a school teacher, first noticed the eruption four years before presentation. It had followed an attack of ptomaine poisoning. The eruption was generalized, symmetrical and sparse, chiefly affecting the side of the trunk, inner aspect of the arms and forearms, dorsum and side of the feet. It consisted of dull reddish or flesh colored papules, varying in size from that of a pinhead to that of a pea, some of which were scaly, others smooth. They were dry, and did not show evidence of having been scratched. In general, the eruption was sparse and suggested an ordinary keratosis pilaris. There was some grouping, without coalescense. The eruption was seen most prominently about the ankles. The scalp was not affected. No other member of the family had suffered from a similar disease. Since the patient had first come under observation, three months before presentation, she had used green soap vigorously, and as a result there had been a great improvement in the eruption, some of the lesions on the trunk being barely noticeable at the time of presentation. Histologic examination of tissue excised from the trunk showed the characteristic appearance of Darier's disease.

DISCUSSION

DR. MACKEE: I congratulate Dr. Fox on the clinical diagnosis he made and then confirmed by biopsy. The eruption was so slight that one might readily miss its significance. Close study, however, shows that the eruption is composed of keratotic follicles. This, with the distribution and the long duration, should make one suspect a condition of Darier's disease.

SARCOID (LICHENOID). Presented by DR. MACKEE.

Mrs. J. S., aged 53, born in Italy, had the eruption for which she was presented for two years. There was nothing significant in the past nor in the family history. The eruption occupied the back of the neck, forehead, nose, ears and the

extensor surfaces of the forearms. In each of these locations the eruption presented an entirely different appearance.

On the back of the neck, there were a large number of closely crowded papules and nodules which ranged in size from that of a pinhead to that of a small pea. The lesions were a brownish red. In fact, the lesions were almost the color of the normal skin of the patient, who was a decided brunette. In the places in which the lesions were extremely close together there was a suggestion of a mosaic or a lichenification. Each lesion was flat-topped, shiny, and most of them were umbilicated. With the exception of the color and the hard consistency, the eruption would pass for lichen planus.

The eruption on the forehead consisted of several infiltrated, slightly elevated, smooth, violaceous plaques, varying in size from that of a dime to that of a quarter. The only lesion on the nose was a tumor. The circumference was the size of a dime, and it was elevated about ⅓ inch (1 cm.). The tumor was somewhat violaceous.

The eruption on the ears consisted of several small, scaly, slightly infiltrated, violaceous patches with some atrophy, suggestive of lupus erythematosus.

On the extensor surface of each forearm were a large number of flat, slightly infiltrated, violaceous, oval lesions, the size of a dime. The center of each lesion was atrophic and had less color. This condition was partly, if not entirely, due to one or several applications of acid of some kind. The margins were almost imperceptibly elevated and composed of tiny, shiny, flat-topped papules. The general appearance here was that of annular lichen planus. The only lesions that were clinically typical of sarcoid were those on the face.

One of the lesions on the neck and one on the forearm had been removed and studied microscopically. The pathologic histology was the same in each instance, namely, a tuberculous architecture in the upper part of the derma compatible with the diagnosis of sarcoid.

A hasty and superficial glance through the literature revealed only one article dealing with lichenoid sarcoid—an article by Carrol Wright of Philadelphia, but his case did not resemble this one. In this case, the resemblance to lichen planus was exceedingly striking and possibly unique. Microscopic specimens were presented with the patient.

DISCUSSION

DR. FRASER: The most interesting feature to me is the clinical resemblance of the lesions on the neck to lichen planus. The lesions on the nose are clinically typical of sarcoid. The histologic picture of all the lesions is typical of Boeck's sarcoid.

DR. RULISON: It is an extremely interesting case because of the great variety of lesions. Those on the back of the neck certainly resemble lichen planus, but the texture is not that of lichen planus.

DR. TRAUB: The lesions on the forearm suggested lichen planus, with central atrophy. I wonder whether there was ever atrophy of such marked degree in a case of sarcoid. The lesions on the shoulder, along a scratch mark, also strongly suggest lichen planus. Have the lesions always been as superficial as at the present time?

DR. WHITEHOUSE: The lesions on the forearm were infiltrated more or less, but were much lessened as a result of caustic treatment. I do not know that any case of sarcoid has ever been presented to this Society that the question of differentiation between lupus erythematosus and sarcoid was not brought up. It is certainly an aberrant type, but I believe that the entire condition is sarcoid.

DR. MACKEE: Of course the condition is sarcoid, and I think it is of the Boeck type. Sarcoid, even that of the Boeck type, is polymorphous in its manifestations. It may produce plaques, nodules and papules, grouped and discrete. It is unusual to have lesions of such varying appearance in one patient. The principal feature in this case, however, is the striking resemblance to lichen planus—even to the extent of umbilication.

A Case for Diagnosis (Epidermolysis Bullosa?). Presented by Dr. Williams.

O. F., aged 13 months, had a generalized bullous eruption, which began when the infant was in the hospital, at the age of 3 days. The condition was treated as pemphigus neonatorum for nine months, but never cleared up. The bullae apparently arose from normal skin—some occurring in streaks along scratch marks. Impetiginous crusts appeared in places, especially on the face. The father and mother both had negative Wassermann reactions. The differential diagnosis seemed to lie between pemphigus, erythema multiforme, epidermolysis bullosa and impetigo contagiosa.

DISCUSSION

Dr. Traub: I think that this is a case of epidermolysis bullosa which has not yet had time to develop the epidermal cysts. The patient must be kept under observation to make a positive diagnosis.

Dr. Whitehouse: I do not think that the condition is impetigo contagiosa, however, I cannot place it nosologically.

Dr. MacKee: I do not believe that it is possible to make an instantaneous clinical diagnosis in such a case; the condition must be inspected clinically over a period of time in order to eliminate several possibilities. I am in favor of a diagnosis of epidermolysis bullosa, and in favor of that diagnosis are the linear lesions which seem to be due to injury, with the marked involvement of the hands, elbows and face. A histologic study might help to decide the question.

Dr. Wise: I favor the diagnosis of epidermolysis bullosa. If one had the opportunity to watch the infant and note whether he developed the small cysts which usually occur on the ears and fingers in these eruptions, I think that would be a strong factor in making the diagnosis of epidermolysis bullosa.

Dr. Clark: I agree with the diagnosis of epidermolysis bullosa. The lesions are not characteristic of impetigo; they are only half filled with a purulent exudate. There are no lesions in the mouth or on the lips as there would probably be in a case of pemphigus or erythema multiforme bullosum.

Dr. Williams: The diagnosis seems to lie between epidermolysis bullosa and impetigo contagiosa, and the former is most likely. I am reminded that the question of drugs has to be investigated in most pemphigoid eruptions. The mother denied that she had taken anything, but that matter will have to be looked into again.

Erythroderma Universale (Neurodermatitis Diffusa?). Presented by Dr. Wise.

B. B., a girl, aged 14, of Italian parentage, from the Post-Graduate Skin Clinic, had the disease of the skin about ten months. It began on the flexures of the knees and elbows in the form of small patches composed of grouped papules. The papules coalesced to form inflamed areas which were subjected to constant scratching. In other words, the beginning of the disease was characteristic of neurodermatitis. The eruption gradually extended over the entire body, including the face and scalp.

On examination, the skin of the body presented a dusky red, edematous, somewhat lichenified and infiltrated eruption, with an absence of scaling. Almost every part of the body, with the exception of the palmar and plantar surfaces, showed evidence of severe scratching.

The patient had been in the ward of the Post-Graduate Hospital during the past six days. In that period the condition of her skin had somewhat improved. Complete examinations of the blood and urine, as well as a physical examination, revealed no abnormalities other than the disease of the skin.

Dr. Wise inquired as to the results obtained by his colleagues from the use of bromides, calcium and sodium thiosulphate by administration intravenously.

DISCUSSION

DR. CLARK: I could not concur in the diagnosis of neurodermatitis. It is the type of case one usually sees in exfoliative dermatitis with lichenification and thickening of the skin around the back of the neck. This patient also had the thickening on the forearm and trunk. Patients with this condition behave peculiarly in response to treatment with sodium thiosulphate: there is a slight improvement, and then the condition remains stationary. If a preparation of calcium is given—one, two or four doses—then one can continue the doses of sodium thiosulphate and get more marked improvement over a period of time, after which treatment with calcium is repeated. In other words, sodium thiosulphate will not clear up the condition; one has to give injections of calcium from time to time; the preparation we are using is calcium chloride urea.

DR. WILLIAMS: I agree with Dr. Clark concerning the diagnosis. The condition is not what I should call neurodermatitis, which is an eruption produced by scratching. The skin in neurodermatitis is dry, thick, leathery, perhaps scaly; in this patient there seems to be a genuine inflammation of the skin. I think the eruption is primary and the scratching secondary; whereas, in neurodermatitis the reverse is true.

DR. BECHET: I agree with Dr. Williams in so far that whatever the eruption is, it does not fit in with my conception of neurodermatitis.

DR. RULISON: I was a little surprised at the diagnosis of neurodermatitis, for it seemed to me more like a generalized eczema. I have no suggestions to make as to treatment.

DR. TRAUB: Since Dr. Wise asked about injections, I would suggest strontium bromide. The only objection to this is that the patients have an immediate marked reaction, which passes away quickly. The drug seems to relieve the itching.

DR. KINGSBURY: I think that Dr. Wise is rather premature in asking for therapeutic suggestions for a patient whom he saw for the first time only a few hours ago. The present more acute phase of the condition calls for symptomatic treatment. Later, observation and intelligent study will be more helpful to the patient than the employment of empiric measures.

DR. MACKEE: The condition does not agree with my conception of the generalized type of neurodermatitis. It is a type of case that one sees frequently —a secondary eczema or dermatitis, which becomes universal and which follows some other dermatitis. These eruptions may be partly toxic and partly due to scratching. I think it is the same type of case that Dr. Wise showed.

Therapeutically, I agree with Dr. Kingsbury, who said that treatment should be symptomatic at first. The limit of therapeutic resourcefulness is often required in such cases before any result is obtained.

SCLERODERMA ASSOCIATED WITH ATROPHY OF THE SKIN. Presented by DR. WISE.

A. C., a woman, aged 29, a housewife, from the Post-Graduate Skin Clinic, had an eruption on the left breast, left arm, left thigh and foot, of one year's duration. In the past year she had much domestic trouble and had lost 15 pounds (6.8 Kg.). Her basal metabolic rate was minus 10. Her general health was good.

The lesions consisted of oval and elongated, well defined, pigmented plaques of a waxy yellow tinge. Those on the trunk had atrophic and soft surfaces, while those on the left arm were distinctly fibrotic and firm to the touch. Telangiectases were present only in the lesions of the upper arm. The lesions varied in size from 1 to 4 inches (2.5 to 10.16 cm.) in diameter.

The patient was undergoing treatment with supersoft (grenz) rays at the Post-Graduate Skin Clinic.

STOMATITIS (DERMATITIS MEDICAMENTOSA?). Presented by DR. MACKEE.

Miss M. H., aged 25, a registered nurse, began to have lesions in the mouth three years prior to presentation. Since then there had been numerous remissions and exacerbations. She was never entirely free from eruption for more than a few weeks. The last attack began one month before presentation.

There were numerous painful erosions on the mucous surfaces of the cheeks and lips. There were a few lesions on the tongue, the floor of the mouth and the hard palate, also on the gums. There was considerable exudate, congestion and pain, but no fetor. There were neither vesicles nor bullae.

There was a marked anemia which appeared to be of the secondary type. The blood did not show evidence of pernicious anemia or leukemia. The lymphatic glands were not palpable, and there had never been any lesions on the skin. A careful search had failed to demonstrate spiral organisms or the fusiform bacillus. At various times the patient had taken phenolphthalein and other drugs, but she said that the attacks did not seem to bear any relation to the ingestion of drugs. Also, various tooth pastes and mouth washes had been used. Since the beginning of the last attack, the patient said that she had not taken drugs and had not used a tooth paste or powder.

Various diagnoses had been considered—dermatitis medicamentosa, dermatitis venenata, erythema multiforme, pemphigus, pernicious anemia and leukemia. The tentative diagnosis was dermatitis medicamentosa.

DISCUSSION

DR. RULISON: Solution of aluminum acetate, diluted 1:5, often gives rapid improvement when used as a mouth wash.

DR. WISE: I am inclined to favor the diagnosis of drug eruption. The condition seems to resemble that seen in patients susceptible to phenobarbital poisoning.

DR. MACKEE: So far as I have been able to ascertain, there has not been any connection between the taking of these drugs and the eruption. However, the tentative diagnosis is dermatitis medicamentosa.

DR. BECHET: Some years ago, a patient with locomotor ataxia who was taking amidopyrine for the relief of "lightning pains," developed a marked stomatitis not at all dissimilar to that of the patient under consideration.

NOTE.—Subsequent to the presentation, the eruption continued and was extremely painful. No drugs were permitted. A weak solution of aluminum acetate was used as a mouth wash, and liver extract was given for the anemia. The eruption entirely disappeared in less than three weeks. However, the disease has disappeared before, so that the diagnosis was still in doubt.

DERMATITIS EXFOLIATIVA. Presented by DR. WISE.

M. S., aged 47, a machinist, was first seen on Aug. 10, 1928, at the Post-Graduate Skin Clinic, at which time he presented a well defined, seborrheic eczema with greasy scales over the face, body and scalp. In a short time the disease became universal, so that the diagnosis was changed tentatively to dermatitis exfoliativa. On examination, the entire body exhibited a uniform scaling erythroderma, with areas of infiltration and lichenification, and associated with profuse brawny desquamation. There were a few white spots, the size of a pea, scattered on the chest and back, which appeared to be depressed and simulated pitted scars; however, these were only spots of normal skin which had escaped the disease process.

The histologic examination proved to be disappointing, as it revealed only a mild inflammatory infiltrate in the corium without exhibiting any significant pathologic changes to account for the clinical picture.

Analyses of the blood and urine did not reveal any abnormalities.

ATROPHY AND TELANGIECTASIA FOLLOWING TREATMENT WITH GRENZ RAYS. Presented by DR. MACKEE.

Mr. S. was previously shown at the March, 1928, meeting to demonstrate injudicious treatment of a case of inveterate psoriasis and a possible permanent sequela following treatment with grenz rays. Four areas had been given one erythema dose of grenz rays. This treatment was followed by slight atrophy, depigmentation and very slight telangiectasia. These areas, a year and a half after exposure, were still present. So far as could be ascertained, roentgen rays had never been applied to these particular areas. When the grenz rays were applied, the particular areas were free of psoriasis, and so far as the patient could remember they had never been the site of lesions. The exposures were made to influence the autonomic nervous system, as advised by Bucky. Curiously, since the previous presentation, psoriasis had developed in one of the areas, the lesion being the exact size of the area exposed.

DISCUSSION

DR. ELLER: When I saw this case eight months ago, the affected area had some telangiectasia which showed distinctly without a magnifying glass. Today, this area seems to be the same.

DR. TRAUB: We had a patient with sycosis vulgaris at the Skin and Cancer Hosital whom Dr. Bucky had treated with grenz rays on the upper lip. Only three such treatments were given, and at no time were roentgen rays employed. The patient now has definite loss of hair and distinct atrophy. The hair has been gone for almost a year.

DR. MACKEE: It has been demonstrated that alopecia can be caused by grenz rays. We had this happen in a case of tinea capitis, and also in the case of an adult who was treated, I think, for epithelioma.

ANESTHETIC LEPROSY. Presented by DR. HOWARD FOX.

F. A., a man, aged 32, a clerk, had suffered from his present eruption for four years. Twelve years previously he had "some patches on the knee," which lasted three months. He was born in Yucatan, Mexico, where he lived all his life except for four years spent in New Orleans (1920 to 1924). He came to New York for treatment five months before presentation. He presented a generalized, rather sparse, eruption of pure maculo-anesthetic type on the face and extremities. It consisted of dull red, anesthetic patches, tending to clear in the center, with reddish brown borders from 1 to 2 cc. in width. One lesion on the face covered the left cheek, upper lip and right supra-orbital region. The ulnar nerves were greatly thickened, nodular and anesthetic. There was marked atrophy of the dorsal interossei muscles and slight tendinous retraction. He had improved greatly during the past five months by treatment with ethyl esters of chaulmoogra oil.

KELOID SUPERIMPOSED FOLLOWING ZOSTER. Presented by DR. BECHET.

B. D., a woman, aged 20, came to the clinic three months previously for the relief of a severe attack of herpes zoster over the left thoracic region. The vesicles had been unusually large. The zoster cleared up, and the patient disappeared from observation. Three months later, she again came to the clinic. At that time she had small, purplish red keloids, arranged in groups on the site of the former zoster. There were neither keloids nor hypertrophic scars anywhere else on the body.

DISCUSSION

DR. MACKEE: I have seen several cases exactly like this one, and have photographs of them.

EPITHELIOMA. Presented by DR. BECHET.

M. S., a woman, aged 25, said that the lesion had been present for one year. It first appeared as a small crusted spot, which she picked off fairly constantly. For three months previous to presentation she had been treating it with a caustic pencil twice a week.

A rounded lesion, about 0.75 mm. in diameter, was observed on the left cheek, about 5 mm. below the eye. Its walls were raised, rounded and pearly. Its center was greatly depressed, showing considerable loss of tissue. The entire lesion was greatly infiltrated. The patient said that it had increased in size rather rapidly of late.

DISCUSSION

DR. TRAUB: I am inclined to believe that the border will disappear in about a month's time with the use of boric acid ointment.

DR. MACKEE: I have seen a number of cases of basal cell epithelioma in patients under 25 years of age, several in patients under 20, and three in patients 17 years of age. In Dr. Bechet's patient, the lesion began at about the age of 17 years. Such cases are not common.

DR. FRASER: In my opinion, this is a basal cell epithelioma.

DR. HOWARD FOX: I suggest that Dr. Bechet apply some kind of dressing that cannot be removed except by himself, and see if the lesion will not clear up. I should suggest a possible diagnosis of dermatitis factitia.

DR. LANE: I think that it would be best to excise the lesion. That procedure would cure the condition and settle the diagnosis at the same time. I think it is an epithelioma.

DR. HOWARD FOX: It has a waxy border and is fairly firm.

DR. BECHET: The lesion though small has a deep crater, showing extensive loss of tissue. The walls are elevated, rounded and pearly. There is marked induration, seemingly fairly deep. To my mind all of these symptoms clearly point to epithelioma. I cannot conceive of a simple traumatic lesion with such an appearance. If I can gain the consent of the patient to an excision, I will report the result of the histologic examination at a subsequent meeting, and will also bring a slide.

DARIER'S DISEASE. Presented by DR. TRAUB.

L. A., a housewife, aged 35 years, was born in Germany. Her father and sister had a skin disease of unknown diagnosis. In both instances, it improved under arsenic therapy. The patient's eruption appeared about sixteen years prior to presentation, as brown papules on the neck, later spreading to the forehead and body. The condition had progressed gradually, until a typical appearance of Darier's disease was produced. The eruption was fairly generalized and consisted of discrete and coalesced, dark, horny papules. In many areas, the eruption was verrucous.

Chemical analysis of the blood showed: sugar, 90.9 mg. per hundred cubic centimeters; urea nitrogen, 8.8 mg. per hundred cubic centimeters, and chlorides, 470 mg. per hundred cubic centimeters. A biopsy showed the characteristic and typical changes seen in Darier's disease.

ARSENICAL CARCINOMA. Presented by DR. FRASER.

M. D., a man, aged 37, was presented at the Section of the Academy in December, 1925 (Society Transactions: ARCH. DERMAT. & SYPH. **13**:569 [Dec.] 1926). During the latter part of 1925, metastases developed in the axilla. The axillary growth was removed surgically, and for nearly two years there was no evidence of a recurrence. The patient reported on Oct. 8, 1928, with a nodule, the size of a bean, of one year's duration, on the skin of the abdomen about 2 inches (5 cm.) to the right of the umbilicus. Histologically, the growth was a squamous carcinoma (grade 2). The arsenical keratoses and pigmentation were unchanged.

PHILADELPHIA DERMATOLOGICAL SOCIETY

CARROLL S. WRIGHT, M.D., *Secretary*

Nov. 2, 1928

S. S. GREENBAUM, M.D., *in the Chair*

ANGIOMA TREATED BY ELECTRODESICCATION. Presented by DR. KLAUDER.

A man, aged 27, until six weeks before presentation, had a flat, vascular birthmark. It had been destroyed by electrodesiccation, and was then healing. Below the eyelid the outline of the scar could be seen. The patient had been treated previously with x-rays, radium and carbon dioxide and the mercury quartz lamp. At one spot there was chronic radiodermatitis, which was included in the destruction. The angioma was not present at that area, but it required destruction.

DISCUSSION

DR. PFAHLER: I have nothing to discuss except to congratulate Dr. Klauder on the excellent result. I am always fearful of destruction around the lower eyelid. It is almost certain to cause contraction and produce an ectropion, which must be repaired later by operation. In this instance, there does not seem to have been much else to do; all the other things had been tried. I think, however, in general that for this type of angioma it is best to use other methods than electrodesiccation. If a contraction results, it has to be relieved by surgical procedure.

DR. KLAUDER: I had told the patient of the possible result, and he was willing that further surgical procedure be carried out if necessary. He was eager to have the angioma removed, for it was an obstacle in obtaining a position as a school teacher. He was unable to get an appointment on account of the lesion, and it was a matter of changing his occupation or getting rid of his facial defect. I do not believe that electrodesiccation is the best method in destruction of the flat type angioma. I used the unipolar method, which is, I think properly called electrodesiccation, as contrasted with the bipolar method or electrocoagulation.

SCLERODERMA. Presented by DR. ASH for DR. CORSON.

T. B., a girl, aged 5 years and one of twins, was first brought to the Skin Clinic of the Children's Hospital in September of the present year. At that time, the patient presented a linear indurated streak along the lateral surface of the right thigh and the inner surface of the left thigh, and two circumscribed lesions on the thorax. A diagnosis of scleroderma was made by Dr. Corson at that time.

It seemed advisable to make a medical study of the case to see if there were any associated conditions. The child was the oldest of four, and the first of twins born prematurely at eight months. The weight at birth was 3 pounds (1.4 Kg.). Further growth and development were uneventful. The patient was always the stronger of the twins until the last two months. She had whooping cough and measles. A short time before the patient came to the clinic the mother noticed what appeared to be a bruise on the outer surface of the right knee. This bruise extended up and down the leg as a yellowish streak; it spread rapidly to the other leg. In September, shortly before the patient was brought to the hospital, the first lesions were noticed on the forehead and thorax. About two weeks later the area just beneath the right eye appeared.

All these lesions were under observation. During the last three months the mother noticed a change in the general condition of the child, who grew fatigued more readily than before, did not play so actively and became restless. A certain amount of polydypsia was shown.

Physical Examination.—The child was well nourished, was 40 inches in height and weighed 37 pounds (16.8 Kg.). The eyes and nose were normal, and the teeth

were in excellent condition; there was a probably chronic infection of the tonsils. The lungs and abdomen were normal, and the heart was not enlarged. The knee jerks were exaggerated. The skin, except in involved areas, was moist and mottled, and there was a certain amount of cyanosis of the lower extremities. A week or so before presentation, the lesions began to itch.

The blood count was as follows: hemoglobin 93 per cent; red blood cells, 6,120,000; white blood cells, 20,200; polymorphonuclears, 42 per cent; lymphocytes, 50 per cent, and eosinophils, 8 per cent.

On examination the physician noted the presence of *Giardia intestinalis*. The urine was light yellow; the specific gravity was 1.026, and there was a faint trace of albumin and sugar. The amount of blood sugar was normal; that of blood urea, 8.4. The Wassermann and tuberculin tests gave negative results.

Thyroid was given empirically. It resulted in increasing the heart rate and palpitation and was stopped. It was questioned whether the thyroid caused the palpitation. A condition similar to that of the skin possibly may have arisen in the pancreas. There were no significant observations except the chronic infection of the tonsils and the renal glycosuria, which are not usually associated with this condition.

DISCUSSION

DR. PFAHLER: I have used roentgen treatment in two cases, but without any satisfactory results.

DR. CORSON: It is one of those cases in which it is a little difficult at first to tell whether the condition is localized or generalized; whether morphea or true scleroderma. At the first visit, when I saw the bandlike distribution over the lower extremities, it rather suggested morphea of the bandlike type, but its appearance as it spread on the trunk (which I do not believe was exhibited) and on the right side of the face, stamps it more as the generalized outbreak. Dr. Ash did not mention that this child's twin has no appearance of the outbreak; curiously enough, she has infected tonsils of a more severe type than this patient exhibits.

Dr Stokes reported a case in which the condition cleared up slowly after infected tonsils were removed. It would be interesting to see if any favorable progress was obtained in the present case after tonsillectomy, which will be performed soon.

The glycosuria is probably a result of the administration of thyroid extract, although the fact that the blood sugar is low is said to be somewhat singular; usually the amount of blood sugar increases to 160 instead of to about 90, as in this case.

PITYRIASIS ROSEA. Presented by DR. KLAUDER.

A man, aged 28, is presented because of a second attack of pityriasis rosea. The first attack began with a patch on his right hip; on this occasion, the first patch was on the back of the left knee. Otherwise the eruptions were much alike in appearance, both being of a severe character. This is only the third instance that I have observed in which pityriasis rosea recurred.

DISCUSSION

DR. WRIGHT: I think that it is a good thing to see cases of this sort now and then to avoid making over emphatic statements to our patients. Patients are frequently told that after one attack of pityriasis rosea they will not have another. This is a good lesson not to be too positive.

DR. GREENBAUM: The common occurrence of pityriasis capitis and the difficulty in distinguishing between it and seborrheic dermatitis should be considered.

TUBERCULOSIS OF THE SKIN. Presented by DR. GILMAN for DR. STOKES.

A student, aged 18, who, as far as determinable, did not have any significant diseases during childhood, showed this eruption for the first time, six years before presentation, after an attack of chickenpox. After that, he was never entirely

free from it. The eruption has been subject to exacerbations. Six years before presentation, he had pulmonary tuberculosis, and made a satisfactory recovery. Tubercular glands were not found. Results of serologic tests were negative. A biopsy was not done.

Over the abdomen and lower part of the back erythemato-papular lesions, varying in size from that of a pinhead to that of a pea, were scattered; each lesion was surmounted by a dry, white scale. The lesions were rather superficial although slightly infiltrated. There were numerous pigmented macules which were evidently the result of previous lesions, but there was no definite scarring.

DISCUSSION

DR. STRAUSS: The superficial appearance of these lesions and the absence of any apparent scarring leads me to think that it is a seborrheic psoriasis rather than an acid-fast condition of any type. There seems to be no scarring or atrophy, and nothing but stains.

DR. SIDLICK: I agree with the diagnosis offered by Dr. Strauss. The lesions are characteristically those of seborrheic dermatitis.

DR. KLAUDER: I am inclined to agree with Dr. Strauss.

DR. HIRSCHLER: I should be rather loath to make a diagnosis without a microscopic section. I do think that the diagnosis of seborrheic psoriasis is a probable one.

DR. GILMAN: Atrophy is present, and there are scales; ulceration can be seen under the microscope.

DR. SIDLICK: On removing the scale of one of the lesions here the bleeding punctae could be observed.

DR. HIRSCHLER: There are some tiny papules present, the size of a pinhead. They are smooth on the surface and do not have scales; these suggest a tuberculid.

NOTE.—A subsequent microscopic study failed to reveal any evidence of tuberculosis of the skin.

GRANULOMA FUNGOIDES. Presented by DR. CROSS for DR. SCHAMBERG.

B. M., a negress, aged 33, single, first appeared in the skin clinic of the Graduate Hospital on July 5, presenting numerous bluish-red, circinate, elevated areas on both arms, the trunk, abdomen and thighs. Several rounded, well circumscribed, bright-red, ulcerative, fungating tumors which varied in size from that of a hickory nut to that of a walnut were visible on the left side of the trunk. Primarily the condition began with small, eczematoid areas on the trunk with severe itching, about seven months before admission. Tumors and elevated areas appeared about four months later.

The blood count and differential count were normal on several examinations; the Wassermann reaction was repeatedly negative. Biopsy showed a heavy round cell infiltration in the corium. Treatment consisted of weekly injections of 0.3 Gm. of neoarsphenamine and 1 skin unit of unfiltered x-ray to the tumorous areas. The flattened elevated patches required only one unit to remove the lesion entirely, and the large fungating tumors, 3 full units of unfiltered x-ray treatments at intervals of three weeks.

Granuloma fungoides is extremely rare in the colored race. Only three cases have been reported previously in the literature.

PSORIASIS. Presented by DR. WRIGHT.

R. S., a colored man, aged 30, presented generalized, rather uniform coin-sized, infiltrated patches, covered with heavy scales. Removal of scale disclosed a capillary oozing. The condition began in June, 1920, and appeared at intervals afterward. So far as the patient knew, he had no white blood. Psoriasis in the negro is an uncommon occurrence.

DISCUSSION

DR. SIDLICK: It is unusual to observe psoriasis in a fullblooded negro. I wonder what the experience of others is in regard to this. I do not think that I have seen more than three or four cases of psoriasis in fullblooded negroes.

DR. WRIGHT: About three years ago, I presented a case of psoriasis in a negro. At that time I looked up the literature and was able to find the reports of only a few similar cases. Many others may have occurred but have not been reported. The other case was not reported except before this Society. Usually these patients will give a history of having some white ancestor. From his appearance one would not suspect this patient of having any white ancestors, and as far as he knew, there was no white blood in the family. These cases are most unusual; this is only the second I have seen in Philadelphia in six years.

DR. SMITH: I think the case looks unusual for psoriasis on account of the fact that the areas are all practically the same size. The scaling does not look like psoriasis. I never have seen psoriasis in a full-blooded negro in my thirty years of experience. I have seen the disease in colored women — but none of them was full-blooded. I have no better suggestion than psoriasis, unless possibly a hypertrophic lichen planus. There is intense itching, and the lesions look somewhat like lichen planus.

DR. CORSON: The lack of confluence of the lesions is remarkable. They are so thickly studded and yet are discrete and separate from each other. It is remarkable, also, that the nails are not affected. I think in such an almost universal psoriasis the eruption would be apt to appear on the toe and finger nails. The nails would be marked, crumbled and opaque. This may possibly be a case of parapsoriasis.

DR. GREENBAUM: If this is a case of psoriasis, it is most unusual. I am not in accord with Dr. Smith's suggestion of lichen planus, but I would like to see a section of one of those papules before making an absolute diagnosis of psoriasis.

NOTE.—The diagnosis of psoriasis was later confirmed by histologic study of a section, and the eruption promptly cleared up, following the application of an ointment containing chrysarobin and salicylic acid.

Book Reviews

THE KAHN TEST. A PRACTICAL GUIDE. By R. L. KAHN, M.S., Sc.D. Price, $2.50. Baltimore: Williams & Wilkins Company, 1928.

In the preface, Dr. Kahn states that this is practically a new edition of that part of his previous book, "Serum Diagnosis of Syphilis by Precipitation," covering procedure. This statement is entirely too modest and does the book an injustice, for the first third of it is given over to an introduction which is by far the most interesting part. It gives a clear and highly instructive presentation of the facts that led up to the Kahn test. The difference between the specific immunity precipitation and that occurring with syphilitic serum, the effect of concentration of reagents, the quantitative relation between antigen and saline solution, demonstrating the zone phenomena, the effect of shaking, the dilution of antigen suspension and serum mixture, are all discussed separately. Their meaning is then brought out in a summary showing that they follow the rules of colloid reactions. Reasons are given for the assumption that the reagins causing the precipitin reaction are the same as those responsible for the complement-fixation reaction.

The remainder of the introductory portion shows how these facts were used in the development of the Kahn reaction.

To return to the preface, the author states that "Although this guide has been prepared especially for laboratory workers it is hoped that physicians will in a general way acquaint themselves with its contents. The intelligent clinical interpretation by physicians of a laboratory method is impossible unless they have at least some general idea of the method; otherwise they are interpreting a name and not a method." This statement is heartily seconded by the reviewer, and the book is recommended to all those who use the test in diagnosis, as well as to all serologists. The rest of the book is devoted to technic.

The two books to follow, covering the clinical application of the test and its fundamental aspects, respectively, will be awaited with interest.

DIE NICHTVENERISCHEN GENITALERKRANKUNGEN. EIN LEHRBUCH FUER AERZTE. Von DR. FRITZ CALLOMON, Arzt fuer Hautkranke in Dessau-Anhalt. Paper. Price, 10 marks. Pp. 204. Leipzig: Georg Thieme, 1928.

Although teachers of dermatology concur in Norman Walker's dictum that "the special seats of preference" of skin eruptions "must be learnt in connection with the different diseases," every student of cutaneous diseases has profited by reading Sabouraud's "Dermatologie Topographique Régionale."

Callomon's "Lehrbuch" on "The Nonvenereal Diseases of the Genitalia" (now appearing in a revised and enlarged edition) the reviewer has found to be equally enlightening.

Intended, primarily, for the man in practice the treatise meets his differential diagnostic wants by succinct descriptions of the cutaneous lesions and of diagnostic methods; his therapeutic requirements, by copious suggestions for treatment.

Judiciously selected pictures aptly illustrate the text which, although placing the practical aspects in the foreground, also presents sufficiently detailed histologic and bacteriologic descriptions.

Only recent publications are cited. The "Hundbuch" of Jadassohn must be consulted for the older literature.

Directory of Dermatologic Societies *

NATIONAL DERMATOLOGIC SOCIETIES

AMERICAN DERMATOLOGICAL ASSOCIATION

Joseph Grindon, President, 4500 Olive St., St. Louis.
C. Guy Lane, Secretary, 416 Marlborough St., Boston.
Place: San Francisco. Time: July 1-3, 1929.

SECTION ON DERMATOLOGY AND SYPHILOLOGY, SCIENTIFIC ASSEMBLY, AMERICAN MEDICAL ASSOCIATION

Jay Frank Schamburg, Chairman, 1402 Spruce St., Philadelphia.
William H. Guy, Secretary, Jenkins Arcade, Pittsburgh.
Place: Portland, Ore. Time: July 8-12, 1929.

BRITISH ASSOCIATION OF DERMATOLOGY AND SYPHILOLOGY (CANADIAN BRANCH)

D. King Smith, President, 122 Bloor St. West, Toronto.
E. J. Trow, Secretary, 122 Bloor St. West, Toronto.

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DERMATOLOGIC SECTION, LOS ANGELES COUNTY MEDICAL ASSOCIATION

George F. Koetter, Chairman, 1136 W. 6th St., Los Angeles.
H. Sutherland-Campbell, Secretary, 1936 Wilshire Blvd., Los Angeles.

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* Secretaries of dermatologic societies are requested to furnish the information necessary for the editor to make this list complete and to keep it up to date.

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Ralph A. Perkins, Secretary, 276 Erskine St., Detroit.

MINNESOTA DERMATOLOGICAL SOCIETY

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D. D. Turnacliff, Secretary, Yeates Bldg., Minneapolis.

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Norman Tobias, Secretary, Missouri Bldg., St. Louis.

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C. Guy Lane, President, 416 Marlborough St., Boston.
Arthur M. Greenwood, Secretary, 416 Marlborough St., Boston.

BRONX DERMATOLOGICAL SOCIETY

L. H. Barenberg, President, 1749 Grand Concourse, New York.
Joseph Golomb, Secretary, 496 E. 175th St., New York.
Place: Concourse Plaza. Time: Second Wednesday of each month, except June, July, August and September.

BROOKLYN DERMATOLOGICAL SOCIETY

W. H. Best, President, 1198 Bushwick Ave., Brooklyn.
A. M. Persky, Secretary, 1750 Ocean Parkway, Brooklyn.

MANHATTAN DERMATOLOGICAL SOCIETY

Mihran B. Parounagian, Chairman, 126 E. 39th St., New York.
David L. Satenstein, Secretary, 116 W. 58th St., New York.

SECTION ON DERMATOLOGY AND SYPHILIS, NEW YORK ACADEMY OF MEDICINE

Isadore Rosen, Chairman, 330 Park Ave., New York.
Ray Hoskins Rulison, Secretary, 145 E. 54th St., New York.

NEW YORK DERMATOLOGICAL SOCIETY

Howard Fox, President, 114 E. 54th St., New York.
Paul E. Bechet, Secretary, 30 E. 40th St., New York.

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Jerome Kingsbury, President, Seventh Ave. and 55th St., New York.
Louis Tulipan, Secretary, 224 E. 17th St., New York.

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